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CORPORATE FINANCE

SIXTH EDITION

THEORY AND PRACTICE

WILEY

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Gabriele Galateri, Chairman of Generali, former Chairman of Telecom Italia and Mediobanca, former CEO of FIAT

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Sharat Gangwani, Head of Research Systems - International Equity, Citadel

“The ‘Vernimmen’ is the perfect reference corporate finance book. I used it in my classes, looked back into it during my internships, use it again now to deep dive into corporate finance for my thesis and know I will keep interacting with it later in my career.”

André Geha, Business Development Manager at Omega Financial Solutions

“Vernimmen's *Corporate Finance* is an outstanding clear and complete manual, a wonderful merger of practice and theory. Its coverage of the market aspects of corporate finance distinguishes its content, but its treatment of all the material makes it essential reading for the student, financier or industrialist.”

Howard Jones, Senior Research Fellow in Finance at Saïd Business School, University of Oxford

“At HEC, Pierre Vernimmen gave me a taste for finance, he taught me the basics. The Vernimmen has been with me throughout my career. It still sits on my desk since I became Chief Executive Officer of Caisse des Dépôts and it is a pleasure to go back to it. Forty years later, I am happy to pay tribute to him here, and to thank his followers for keeping his teaching alive so brilliantly.”

Éric Lombard, Chief Executive Officer of Caisse des Dépôts

“The book itself covers all the important techniques that a financial manager must have in his repertoire of tools. The exposition is clear and concise and, most importantly, relies on commonsense reasoning throughout. This is not a book with obscure formulae, yet is still rigorous and at the same time a model of clarity.”

Richard Roll, Professor Emeritus, Joel Fried Chair in Applied Finance at UCLA Anderson

The Vernimmen remains my bible, the only one updated every year.

Jean-Jacques Guiony, Chief Financial Officer of LVMH

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CORPORATE FINANCE

THEORY AND PRACTICE

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Pierre Vernimmen, who died in 1996, was both an M&A dealmaker (he advised Louis Vuitton on its merger with Moët Hennessy to create LVMH, the world luxury goods leader) and a finance teacher at HEC Paris. His book *Finance d'Entreprise* was, and still is, the top-selling financial textbook in French-speaking countries and is the forebear of *Corporate Finance: Theory and Practice*.

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Preface

This book aims to cover the full scope of corporate finance as it is practised today worldwide.

A way of thinking about finance

We are very pleased with the success of the first five editions of the book. It has encouraged us to retain the approach in order to explain corporate finance to students and professionals. There are four key features that distinguish this book from the many other corporate finance textbooks available on the market today:

Our strong belief that financial analysis is part of corporate finance. Pierre Vernimmen, who was mentor and partner to some of us in the practice of corporate finance, understood very early on that a good financial manager must first be able to analyse a company's economic, financial and strategic situation, and then value it, while at the same time mastering the conceptual underpinnings of all financial decisions.

Corporate Finance is neither a theoretical textbook nor a practical workbook. It is a book in which theory and practice are constantly set off against each other, in the same way as in our daily practice as investors at Monestier capital and Natixis, as board members of several listed and unlisted companies, and as teachers notably at HEC Paris business school.

Emphasis is placed on concepts intended to give you an understanding of situations, rather than on techniques, which tend to shift and change over time. We confess to believing that the former will still be valid in 20 years' time, whereas the latter will, for the most part, be long forgotten!

Financial concepts are international, but they are much easier to grasp when they are set in a familiar context. We have tried to give examples and statistics from all around the world to illustrate the concepts.

The five sections

This book starts with an introductory chapter reiterating the idea that corporate financiers are the bridge between the economy and the realm of

finance. Increasingly, they must play the role of marketing managers and negotiators. Their products are financial securities that represent rights to the firm's cash flows. Their customers are bankers and investors. A good financial manager listens to customers and sells them good products at high prices. A good financial manager always thinks in terms of value rather than costs or earnings.

Section I goes over the basics of financial analysis, i.e. understanding the company based on a detailed analysis of its financial statements. We are amazed at the extent to which large numbers of investors neglected this approach during the latest stock market euphoria. When share prices everywhere are rising, why stick to a rigorous approach? For one thing, to avoid being caught in the crash that inevitably follows.

The return to reason has also returned financial analysis to its rightful place as a cornerstone of economic decision-making. To perform financial analysis, you must first understand the firm's basic financial mechanics (Chapters 2). Next you must master the basic techniques of accounting, including accounting principles, consolidation techniques and certain complexities (Chapters 6), based on international (IFRS) standards now mandatory in over 80 countries, including the EU (for listed companies), Australia, South Africa and accepted by the SEC for US listing. In order to make things easier for the newcomer to finance, we have structured the presentation of financial analysis itself around its guiding principle: in the long run, a company can survive only if it is solvent and creates value for its shareholders. To do so, it must generate wealth (Chapters 9 and 10), invest (Chapter 11), finance its investments (Chapter 12) and generate a sufficient return (Chapter 13). The illustrative financial analysis of the Italian appliance manufacturer Indesit will guide you throughout this section of the book.

Section II reviews the basic theoretical knowledge you will need to make an assessment of the value of the firm. Here again, the emphasis is on reasoning, which in many cases will become automatic (Chapters 15): efficient capital markets, the time value of money, the price of risk, volatility, arbitrage, return, portfolio theory, present value and future value, market risk, beta, etc. Then we review the major types of financial securities: equity, debt and options, for the purposes of valuation, along with the techniques for issuing and placing them (Chapters 20).

Section III, is devoted to value, to its theoretical foundations and to its computation. Value is the focus of any financier, both its measure and the way it is shared. Over the medium term, creating value is, most of the time, the first aim of managers (Chapters 26).

In **Section IV**, “Corporate financial policies”, we analyse each financial decision in terms of:

value in the context of the theory of efficient capital markets;

balance of power between owners and managers, shareholders and debtholders (agency theory);

communication (signal theory).

Such decisions include choosing a capital structure, investment decisions, cost of capital, dividend policy, share repurchases, capital increases, hybrid security issues, etc.

In this section, we draw your attention to today's obsession with earnings per share, return on equity and other measures whose underlying basis we have a tendency to forget and which may, in some cases, be only distantly related to value creation. We have devoted considerable space to the use of options (as a technique or a type of reasoning) in each financial decision (Chapter 32).

When you start reading **Section V**, “Financial management”, you will be ready to examine and take the remaining decisions: how to create and finance a start-up, how to organise a company's equity capital and its governance, buying and selling companies, mergers, demergers, LBOs, bankruptcy and restructuring (Chapter 40). Lastly, this section presents working capital management, cash management, the management of the firm's financial risks and its operational real estate assets (Chapter 49).

Last but not least, the epilogue addresses the question of the links between finance and strategy.

Suggestions for the reader

To make sure that you get the most out of your book, each chapter ends with a summary and a series of problems and questions (over 800 with the solutions provided). We've used the last page of the book to provide a crib

sheet (the nearly 1,000 pages of this book summarised on one page!). For those interested in exploring the topics in greater depth, there is an end-of-chapter bibliography and suggestions for further reading, covering fundamental research papers, articles in the press, published books and websites. A large number of graphs and tables (over 100!) have been included in the body of the text and these can be used for comparative analyses. Finally, there is a fully comprehensive index.

An Internet site with huge and diversified content

www.vernimmen.com provides free access to tools (formulas, tables, statistics, lexicons, glossaries); resources that supplement the book (articles, prospectuses of financial transactions, financial figures for over 16,000 European, North American and emerging countries, listed companies, thesis topics, thematic links, a list of must-have books for your bookshelf, an Excel file providing detailed solutions to all of the problems set in the book); plus problems, case studies and quizzes for testing and improving your knowledge. There is a letterbox for your questions to the authors (we reply within 72 hours, unless, of course, you manage to stump us!). There are questions and answers and much more. The site has its own internal search engine, and new services are added regularly.

A teachers' area provides teachers with free access to case studies, slides and an Instructor's Manual, which gives advice and ideas on how to teach all of the topics discussed in the book.

A free monthly newsletter on corporate finance

Since (unfortunately) we can't bring out a new edition of this book every month, we have set up the *Vernimmen.com Newsletter*, which is sent out free of charge to subscribers via the web. It contains:

A conceptual look at topical corporate finance problems (e.g. accounting for operating and capital leases, financially managing during a deflation phase).

Statistics and tables that you are likely to find useful in the day-to-day practice of corporate finance (e.g. corporate income tax rates, debt ratios in LBOs).

A critical review of a financial research paper with a concrete dimension (e.g. *the real effect of corporate cash, why don't US issuers demand European fees for their IPOs?*).

A question left on the *vernimmen.com* site by a visitor plus a response (e.g. *Why do successful groups have such a low debt level? What is an assimilation clause?*).

A catch up of our last posts on LinkedIn and Facebook.

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And lastly a LinkedIn and Facebook page

We publish daily comments on financial news that we deem to be of interest, answer questions from web-users and publish finance- and business-related quotes. These could come in useful when preparing for a job interview or serve as food for thought for those of you wanting to take time out and think about what's going on in the corporate and financial world.

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We hope that you will gain as much enjoyment from your copy of this book – whether you are a new student of corporate finance or are using it to revise and hone your financial skills – as we have had in editing this edition and in expanding the services and products that go with it.

We wish you well in your studies!

Paris, New York, December 2021

Pascal Quiry *Yann Le Fur*

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Frequently used symbols

A_K^N	Annuity factor for N years and an interest rate of k
ABCP	Asset-Backed Commercial Paper
ADR	American Depositary Receipt
AGM	Annual General Meeting
APT	Arbitrage Pricing Theory
APV	Adjusted Present Value
BIMBO	Buy-In Management Buy-Out
BV	Book Value
BV/S	Book Value per Share
CAGR	Compound Annual Growth Rate
Capex	Capital Expenditures
CAPM	Capital Asset Pricing Model
CB	Convertible Bond
CD	Certificate of Deposit
CE	Capital Employed
CFROI	Cash Flow Return On Investment
COV	Covariance
CVR	Contingent Value Right
D	Debt, net financial and banking debt
d	Payout ratio
DCF	Discounted Cash Flows
DDM	Dividend Discount Model
DECS	Debt Exchangeable for Common Stock; Dividend Enhanced Convertible Securities
Div	Dividend

DPS	Dividend Per Share
EBIT	Earnings Before Interest and Taxes
EBITDA	Earnings Before Interest, Taxes, Depreciation and Amortisation
ECP	European Commercial Paper
EGM	Extraordinary General Meeting
EMTN	Euro Medium-Term Note
ENPV	Expanded Net Present Value
EONIA	Euro OverNight Index Average
EPS	Earnings Per Share
E(r)	Expected return
ESOP	Employee Stock Ownership Programme
Euribor	Euro Interbank Offered Rate
EV	Enterprise Value
EVA	Economic Value Added
f	Forward rate
F	Cash flow
FA	Fixed Assets
FASB	Financial Accounting Standards Board
FC	Fixed Costs
FCF	Free Cash Flow
FCFE	Free Cash Flow to Equity
FCFF	Free Cash Flow to Firm
FE	Financial Expenses
FIFO	First In, First Out
FRA	Forward Rate Agreement
g	Growth rate
GAAP	Generally Accepted Accounting Principles
GDR	Global Depositary Receipt
i	After-tax cost of debt

IAS	International Accounting Standards
IASB	International Accounting Standards Board
IFRS	International Financial Reporting Standard
IPO	Initial Public Offering
IRR	Internal Rate of Return
IRS	Interest Rate Swap
IT	Income Taxes
k	Cost of capital, discount rate
k_D	Cost of debt
k_E	Cost of equity
K	Option strike price
LBO	Leveraged Buyout
LBU	Leveraged Build-Up
L/C	Letter of Credit
LIBOR	London Interbank Offered Rate
LIFO	Last In, First Out
LMBO	Leveraged Management Buyout
ln	Naperian logarithm
LOI	Letter Of Intent
m	Contribution margin
MOU	Memorandum Of Understanding
MTN	Medium-Term Notes
MVA	Market Value Added
n	Years, periods
N	Number of years
$N(d)$	Cumulative standard normal distribution
NA	Not Available
NAV	Net Asset Value

NM	Not Meaningful
NOPAT	Net Operating Profit After Tax
NPV	Net Present Value
OTC	Over The Counter
P	Price
PBO	Projected Benefit Obligation
PBR	Price-to-Book Ratio
PBT	Profit Before Tax
P/E ratio	Price/Earnings ratio
PEPs	Personal Equity Plans
PERCS	Preferred Equity Redemption Cumulative Stock
PSR	Price-to-Sales Ratio
P-to-P	Public-to-Private
PV	Present Value
PVI	Present Value Index
QIB	Qualified Institutional Buyer
r	Rate of return, interest rate
r_{F}	Risk-free rate
r_{M}	Expected return of the market
RNAV	Restated Net Asset Value
ROA	Return On Assets
ROCE	Return On Capital Employed
ROE	Return On Equity
ROI	Return On Investment
RWA	Risk-Weighted Assessment
S	Sales
SEC	Securities and Exchange Commission
SEO	Seasoned Equity Offering

SPV	Special Purpose Vehicle
STEP	Short-Term European Paper
t	Time
T	Time remaining until maturity
T_c	Corporate tax rate
TSR	Total Shareholder Return
UCITS	Undertakings for Collective Investment in Transferable Securities
V	Value
V_D	Value of Debt
V_E	Value of Equity
$V(r)$	Variance of return
VAT	Value Added Tax
VC	Variable Cost
WACC	Weighted Average Cost of Capital
WC	Working Capital
y	Yield to maturity
YTM	Yield To Maturity
Z	Scoring function
ZBA	Zero Balance Account
β or β_E	Beta coefficient for a share or an equity instrument
β_A	Beta coefficient for an asset or unlevered beta
β_D	Beta coefficient of a debt instrument
$\sigma(r)$	Standard deviation of return
ρ(A, B)	Correlation coefficient of return between shares A and B

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Chapter 1
TOWARDS A GREEN, RESPONSIBLE AND SUSTAINABLE CORPORATE FINANCE

Trailer for a changing world…

The primary role of the financial manager is to ensure that their company has a sufficient supply of capital.

The financial manager or CFO (chief financial officer) is at the crossroads of the real **economy**, with its industries and services, and the world of **finance**, with its various financial markets and structures.

They also have two other roles: that of a controller of the risks and commitments made by the company, thereby ensuring its sustainability; and that of a strategist, which can make them invaluable to the executive.

The financial manager operates in an environment that is undergoing irreversible change due to growing environmental, social and governance concerns within the company. This change is naturally and durably affecting corporate finance, strongly since 2017–2018, and at a speed that has accelerated considerably in 2020–2021.

We believe that this development in corporate finance is so important that we will discuss it in the first three sections of this introductory chapter, before returning to the functions of the CFO, who has a part to play in the area of energy and social transition.

Section 1.1 AN UNPRECEDENTED CHANGE UNDERWAY

The years between 2015 and 2020 saw an irreversible upswing in concern for the environment, social responsibility and sustainability in finance, and in particular in corporate finance, to such an extent that we predict, in a slightly pretentious way, that corporate finance will in the future be green, responsible and sustainable, or it will not be at all!

1/ SOME EMBLEMATIC FACTS

Here are some recent facts, among others, which illustrate this acceleration in ecological, social and sustainable awareness in the financial world:

Financial analysts from the largest sovereign wealth fund in the world, Norway's oil fund, which manages around €1,133bn, are now accompanied by environmental, social and governance (ESG) analysts when they hold meetings with managers of any of the 9,123 companies in which the fund is a shareholder or is considering becoming one;

Danone (in 2020) and Kering are now presenting new financial tools (decarbonised earnings per share for Danone and environmental income statement for Kering) to measure the impact of the group on carbon emission or environment;

In 2018, the CEO of Blackrock – the largest asset manager in the world with close to €7,400bn in assets under management – wrote in the annual letter to the CEOs of major groups worldwide in which Blackrock has invested money:

"Society is demanding that companies, both public and private, serve a social purpose. To prosper over time, every company must not only deliver financial performance, but also show how it makes a positive contribution to society. Companies must benefit all of their stakeholders, including shareholders, employees, customers, and the communities in which they operate".

As early as 2016, Larry Finck wrote in his annual letter to the CEOs: *"Over the long term, environmental, social and governance issues – from climate change to diversity and including board efficiency – have real and quantifiable financial impacts."*

In March 2018, the European Commission published its "*strategy to bring the financial system to support the European Union's climate and sustainable development agenda*", which will involve:

"*– establishing a common language for sustainable finance, i.e. a unified* ***EU classification system – or taxonomy*** *– to define what is sustainable and identify areas where sustainable investment can make the biggest impact;*

– creating ***EU labels*** *for green financial products on the basis of this EU classification system: this will allow investors to easily identify investments that comply with green or low-carbon criteria;*

– clarifying the ***duty of asset managers and institutional investors*** *to take sustainability into account in the investment process and enhance disclosure requirements;*

– requiring insurance and investment firms to advise clients on the basis of their preferences on sustainability;

– incorporating ***sustainability in prudential requirements****: banks and insurance companies are an important source of external finance for the European economy. The Commission will explore the feasibility of recalibrating capital requirements for banks (the so-called green supporting factor) for sustainable investments, when it is justified from a risk perspective, while ensuring that financial stability is safeguarded;*

– enhancing transparency in ***corporate reporting****: we propose to revise the guidelines on non-financial information to further align them with the recommendations of the Financial Stability Board's Task Force on Climate-related Financial Disclosures (TCFD)."*

In 2019, a large European bank, Natixis, introduced a voluntary mechanism for the internal allocation of prudential capital, which lowers the cost of financing with a positive impact on the environment, to the detriment of financing with a negative impact, thus increasing its cost. Moreover, it directs its commitments towards actors with a positive approach in this area.

2/ OLD OR RECENT ROOTS

We may well wonder why this is happening now and not five or ten years ago, or in four to five years' time. It's difficult to say. Like all groundswell

movements, it started as the result of several factors, has been developing gradually and slowly over time and now that has gained momentum, it's shaking up the whole system.

Environmental urgency is another factor: the depletion of the earth's resources, which may well turn out to be a surmountable problem given human ingenuity, and global warming, which it is to be feared may well be a problem that we have underestimated.

It is undeniable that **the 2007–2008 financial crisis** had a major impact on how we see the world, probably more so than any other financial crisis, apart from the 1929 crisis. It naturally impacted on the way finance directors exercise financial management.[1] It also had a major impact on the general public who discovered that a financial product, sub-primes,[2] involved getting clients to borrow more than what was reasonable while getting others to take on the risk in order to get rich at their expense, with no regard for the consequences. This is now seen as morally unacceptable. Never again.

Finally, a **disenchantment with ideologies** and the growing difficulties that governments are experiencing in maintaining their traditional post-World War II roles of protector and distributor of resources, mean that individuals are now seeking meaning in what they spend most of their lives doing, which is working. Young people in particular want a mission in life and not a job, a mentor rather than a boss, and they want to make an impact and see meaning in what they do. Today, a lot more is expected from companies than in the past. More and more corporate people think that the company has a purpose and that it contributes to the common interest.

Without being cynical, we should also not overlook the phenomenon of **lemming behaviour** which is something we're very familiar with in the world of finance. Companies seem to be competing against each other in the increasingly ambitious ESG statements that they put out. This is not cause for complaint, but now they're going to have to deliver.

Section 1.2 A DECISIVE IMPETUS FROM INVESTORS

What concrete forms does all this take?

Among investors, concerns about socially responsible investment (SRI) first arose in the 18th century in religious communities (Quakers, Methodists), which forbade their members from investing in companies that produced weapons, alcohol or tobacco.

Environmental, social and governance (ESG) criteria have emerged to enable investors wishing to work towards this goal to select the companies they consider to be the most virtuous in these areas. They constitute the three pillars of extra-financial analysis that complement the financial analysis of the accounts that we present in Section I of this book:

The **environmental** criterion covers the reduction of greenhouse gas emissions, the recycling of waste, the management of scarce resources (raw materials, water, etc.) and the prevention of environmental risks.

The **social** criterion takes into account accident prevention, staff training, respect for employee rights, employment of disabled people, management of the subcontracting chain, and more generally the quality of social dialogue.

The **governance** criterion mainly covers the independence of the board of directors, the company's management structure, the transparency of executive compensation, the fight against corruption, and the increase in the number of women on the board of directors and the executive committee. It is detailed in Chapter 43.

Around $30,700bn is managed around the world using ESG criteria,[3] i.e. a third of all financial assets under management but 49% in Europe, which is leading the world in this field. The strategies implemented are more or less intense: the *Best in Class* strategy advocates investing within a sector in the best performing companies from an ESG point of view; the *Best Effort* strategy is less radical in its selection because it includes more broadly the companies with the best ESG progress. The *norm-based screening* strategy sets minimum ESG standards for a company to be included in a portfolio.

Some investors wish to go further and have developed **SRI** (**socially responsible investment**) defined as “an investment that aims to achieve a social and environmental impact by financing companies and public entities that contribute to sustainable development regardless of their sector of activity. By influencing the governance and behaviour of stakeholders, SRI encourages a responsible economy.”[4]

In the field of unlisted investments, **impact funds** aim to generate a positive social and environmental impact in addition to a financial return. The remuneration of their managers is linked to the achievement of predetermined non-financial objectives.

In Section 8.2, 4/, we maintain that from a strictly financial point of view, the most important men and women in a company are its shareholders. SRI is an illustration of this as by overweighting or underweighting certain companies in their portfolios (or even totally eliminating them) investors, like other stakeholders, exercise media and financial pressure on these companies, making them more expensive to finance, leading in the long run to a reduction in their activities.

In May 2021, Engine No. 1 – a small American investment fund with a 0.02% stake in ExxonMobil (market capitalisation of €200bn) – succeeded in rallying the majority of the American oil company's shareholders to elect as directors three people who wanted ExxonMobil to initiate its energy transition, as opposed to three other candidates who were in favour of the status quo and who were supported by the management.

Although there have long been doubts about the compatibility of responsible investment with financial performance, a number of empirical studies have shown that SRI funds achieve identical or better performances than conventional funds. A Russel Investment[5] study shows that asset managers that create the most value already have a large number of stocks that comply with ESG criteria in their portfolios.

Section 1.3 BUSINESS BEHAVIOUR AND THEIR FINANCING ARE GRADUALLY CHANGING

Under pressure from investors and society in general, companies are becoming aware of their corporate social responsibility (CSR), defined, for example, by the European Union as: “The voluntary integration of social and environmental concerns by companies into their business activities and their relations with their stakeholders. Being socially responsible means not only fully complying with applicable legal obligations, but also going beyond them and investing ‘more' in human capital, the environment and stakeholder relations.”

1/ THE EMERGENCE OF GREEN AND RESPONSIBLE FINANCING

When it comes to financing of companies, volumes of green or sustainable financing are still marginal at this stage, but have increased sharply. Today we get green bonds (Section 20.4), green loans (Section 21.2) and social bonds (Section 20.4).

Green bonds are conventional bonds in terms of their financial flows so the innovation here is not financial! Their green status stems from the issuer's undertaking to use the funds for investing or spending that is positive for the environment (as defined by the company, which is generally assisted by an independent firm). Social bonds finance socially responsible projects.

Monitoring spending and allocating a source of financing to a particular use requires a specific type of organisation that financial departments are not accustomed to. And it has a cost, borne by companies as long as investors are not prepared to pay more for green bonds than for conventional bonds.

Standards for green, social and more generally responsible bonds are established by the ICMA,[6] which publishes the Green Bonds Principles and Social Bonds Principles. This is important as investors rely on these standards in order to demonstrate that their investments are SRI compliant and that these bonds are eligible for inclusion in their funds or their asset portfolios dedicated to such investments.

Companies have another financial tool they can use for ESG policy implementation: green or responsible revolving credit facilities (RCFs[7]). Unlike bonds, these facilities do not require funds to be used for ESG projects (this would be complicated as for large groups, these facilities are mostly back-up undrawn credit lines). Their ESG aspect comes from the fact that their cost (and thus the banks' remuneration) depends on the company achieving ESG goals. The relevance of these goals is initially validated by an independent agency and is subject to monitoring while the credit facility is active. We note that these products entail an ESG cost both for the company and the bank financing it! At this stage, the variability of the credit margin, which is dependent on whether the ESG goals are achieved or not, is still only a few basis points.

Notwithstanding the above, **ESG-type financing products are also used to mobilise employees internally** given that ESG goals become more concrete since failing to achieve them results in a (small) financial penalty and has a psychological impact that is certainly not negligible.

2/ ESG STANDARDS ARE NOT YET STABILISED

This development has brought its own problems. How do we go about assessing, rating and ranking companies on the basis of ESG criteria? What are the most relevant criteria and for whom are they relevant? Clearly, assessments should be sector-based as an agri-food business will not face the same ESG challenges as a power generating company. Agencies that rate companies on the basis of their ESG policies (Vigeo Eiris, Cicero and Sustainalytics) are emerging, the traditional rating agencies and audit firms are also seeking to get in on the act as are the certification agencies (Bureau Veritas, SGS) while standards (ISO) will soon be developed.

One of the problems that companies are having to face remains the lack of a uniform and dynamic method for selecting these criteria. New criteria are continually arising (sometimes in response to the latest trends or because new controversies have emerged) and companies are having to be agile if they want to hang onto their ratings or certifications.

One of the problems raised by green or social bonds is that funds raised must be used for ESG investments. This means they are easy to issue for very capital-intensive businesses (energy, real estate, etc.), but much trickier

for knowledge-based industries (what sort of investment by an advertising agency could be classified as green or social?) So, in today's world, these companies are unable to make use of this tool even if they happen to have impeccable ESG credentials.

This highlights the difference between the holistic and the targeted project approach to ESG. The former is clearly more ambitious but difficult to measure, standardise and grasp for anyone outside the company. There is the fear that companies may indulge in communication one-upmanship and greenwashing without taking any real action, all in the interests of political correctness. The latter approach is more concrete for investors, but involves a risk of financing companies that generally do not have very impressive ESG ambitions and only communicate on a few projects.

3/ A TOUGH CONSTRAINT

But let's not deceive ourselves. This is most definitely not just a passing trend to which homage should be paid for a short time, before returning to the way we used to do things in the good (or rather bad) old days!

> A company that chooses to ignore the ESG concerns is doomed to fail as a result of the dual effect of an increase in its financing cost (since investors will gradually decline to finance it) or increasingly higher costs, which will penalise it vis-à-vis its competitors; and the growing difficulty of attracting human talent without which everything is a lot more complicated. And there is also the permanent risk of being stigmatised and suffering general social opprobrium.

The good news is that the long-term view doesn't seem to be exclusively focused on financial performance. From the point of view of companies, the Boston Consulting Group[8] shows that, out of a sample of 343 groups in 5 sectors, companies with a high ESG score have higher margins than others. The direction of causality still needs to be determined. The fact that companies with higher ethical standards are more attractive to employees is one explanation. Other explanations also highlight better risk management as a result of ESG issues being factored in and the creation of opportunities. As an example, ArcelorMittal has announced that a new technology for

treating gas produced by its Gand plant will enable it to transform gas into bio-ethanol that it will be able to sell.

Section 1.4 THE THREE ROLES OF THE FINANCIAL MANAGER

While the primary role of the corporate financial manager is to be responsible for the provision of capital to the company, they also have a role in monitoring profitability and risk, which ensures sustainability, and the ESG commitments made to the investors who finance the company. The best of them are also strategists.

1/ THE FINANCIAL MANAGER IS FIRST AND FOREMOST A SALESPERSON AND A NEGOTIATOR

(a) The financial manager's job is not only to “buy” financial resources …

Financial managers are traditionally perceived as buyers of capital. They negotiate with a variety of investors – bankers, shareholders, bond investors – to obtain funds at the lowest possible cost.

Transactions that take place on the **capital markets** are made up of the following elements:

a commodity: money;

a price: the interest rate in the case of debt; dividends and capital gains in the case of equities.

In the traditional view, financial managers re responsible for the company's financial procurement. Their job is to minimise the price of the **commodity** to be purchased, i.e. the **cost of the funds** they raise.

We have no intention of contesting this view of the world. It is obvious and is confirmed every day, in particular in the following types of negotiations:

between corporate treasurers and bankers, regarding interest rates and value dates applied to bank balances (see Chapter 50);

between CFOs and financial market intermediaries, where negotiation focuses on the commissions paid to arrangers of financial transactions (see Chapter 25).

(b) … but also to sell financial securities

That said, let's now take a look at the financial manager's job from a different angle:

they are not a buyer but a **seller**;

their aim is not to reduce the cost of the raw material they buy but to **maximise a selling price**;

they practise their art not on the capital markets, but on the market for financial instruments, be they loans, bonds, shares, etc.

We are not changing the world here; we are merely looking at the same market from another point of view:

the **supply** of financial securities corresponds to the demand for capital;

the **demand** for financial securities corresponds to the supply of capital;

the **price**, the point at which the supply and demand for financial securities are in equilibrium, is therefore the **value of security**. In contrast, the equilibrium price in the traditional view is considered to be the interest rate, or the cost of funds.

We can summarise these two ways of looking at the same capital market in the following table:

Analysis/Approach	Financial approach: financial manager as seller	Traditional approach: financial manager as purchaser
Market	Securities	Capital
Supply	Issuers	Investors
Demand	Investors	Issuers
Price	Value of security	Interest rate

Depending on your point of view, i.e. traditional or financial, supply and demand are reversed, as follows:

when the **cost of money** – the interest rate, for example – **rises**, demand for funds is greater than supply. In other words, the supply of financial securities is greater than the demand for financial securities, and **the value of the securities falls**;

conversely, when **the cost of money falls**, the supply of funds is greater than demand. In other words, the demand for financial instruments is greater than their supply and **the value of the securities rises**.

> The cost of capital and the value of the securities vary in opposite directions. We can summarise with the following theorem, fundamental to this entire book: Minimising financing cost is synonymous with maximising the value of the underlying securities.

For two practical reasons, one minor and one major, we prefer to present the financial manager as a seller of financial securities.

The minor reason is that viewing the financial manager as a salesperson trying to sell their products at the highest price casts their role in a different light. As the merchant does not want to sell low-quality products but products that respond to the needs of their customers, so the financial manager must understand and satisfy the needs of their capital suppliers without putting the company or its other capital suppliers at a disadvantage. **The financial manager must sell high-quality products at high prices** but can also repackage the product to better meet investor expectations. Indeed, financial markets are subject to fashion: in one period convertible bonds (see Chapter 24) can be easily placed; in another period it will be syndicated loans (see Chapter 21) that investors will welcome.

The more important reason is that when a financial manager applies the traditional approach of minimising the cost of the company's financing too strictly, erroneous decisions may easily follow. The traditional approach can make the financial manager **short-sighted**, tempting them to take decisions that emphasise the short term to the detriment of the long term.

For instance, choosing between a capital increase, a bank loan and a bond issue with lowest cost as the only criterion reflects flawed reasoning. Why? Because suppliers of capital, i.e. the buyers of the corresponding instruments, do not all face the same level of risk.

The investor's risk must be taken into account in evaluating the cost of a source of financing.

The cost of two sources of financing can be compared only when the suppliers of the funds incur the same level of risk.

All too often we have seen managers or treasurers assume excessive risk when choosing a source of financing because they have based their decision on a single criterion: the respective cost of the different sources of funds. For example:

increasing short-term debt on the pretext that short-term interest rates are lower than long-term rates can be a serious mistake;

granting a mortgage in return for a slight decrease in the interest rate on a loan can be very harmful for the future;

increasing debt systematically on the sole pretext that debt costs less than equity capital jeopardises the company's prospects for long-term survival.

We will develop this theme further throughout the third part of this book, but we would like to warn you now of the pitfalls of faulty financial reasoning. **The most dangerous thing a financial manager can say is, “It doesn't cost anything.” This sentence should be banished and replaced with the following question: “What is the impact of this action on value?”**

(c) Most importantly, the financial manager is a negotiator …

But what exactly is our financial manager selling? Or, put another way: how can the value of the financial security be determined?

From a practical standpoint, the financial manager “sells” management's reputation for integrity, its expertise, the quality of the company's assets, its overall financial health, its ability to generate a certain level of profitability over a given period and its commitment to more or less restrictive legal terms. Note that the quality of assets will be particularly important in the case of a loan tied to and often secured by specific assets, while overall financial health will dominate when financing is not tied to specific assets.

Theoretically, the financial manager sells expected future cash flows that can derive only from the company's business operations.

A company cannot distribute more cash flow to its providers of funds than its business generates. A money-losing company pays its creditors only at the expense of its shareholders. When a company with sub-par profitability pays a dividend, it jeopardises its financial health.

The financial manager's role is to transform the company's commercial and industrial business assets and commitments into financial assets and commitments.

In so doing, they spread the expected cash flows among many different investor groups: banks, financial investors, family shareholders, individual investors, etc.

Financial investors then turn these flows into negotiable instruments traded on an open market, which values the instruments in relation to other opportunities available on the market.

Underlying the securities is the market's evaluation of the company. A company considered to be poorly managed will see investors vote with their feet. Yields on the company's securities will rise to prohibitive levels and prices on them will fall. Financial difficulties, if not already present, will soon follow. Financial managers must therefore keep the market convinced at all times of the quality of their company, because that is what backs up the securities it issues!

The different financial partners hold a portion of the value of the company. This diversity gives rise to yet another job for the financial manager: **to adroitly steer the company through the distribution of the overall value of the company**.

Like any dealmaker, the financial manager has something to sell, but must also:

assess the company's overall financial situation;

understand the motivations of the various participants;

analyse the relative powers of the parties involved.

2/ THE FINANCIAL MANAGER IS ALSO A CONTROLLER

(a) Of profitability as a guarantee of sustainability

The financial investors who buy the company's securities do so not out of altruism, but because they hope to realise a certain rate of return on their investment, in the form of interest, dividends and/or capital gains. In other words, in return for entrusting the company with their money via their purchase of the company's securities, they require a minimum return on their investment.

The financial manager must therefore analyse the different investment projects proposed by operational people and explain to colleagues that some should not be undertaken because they are not profitable enough compared to the return investors are looking for. In short, financial managers sometimes have to be “party-poopers”. They are indirectly the spokesperson of the financial investment community.

Consequently, the financial manager must make sure that over the medium term the company makes investments with returns at least equal to the rate of return expected by the company's providers of capital. If so, all is well. If not, if the company is consistently falling short of this goal, then it will destroy value, turning what was worth 100 into 90, or 80. This is corporate purgatory. On the other hand, if the profitability of its investments consistently exceeds investor demands, transforming 100 into 120 or more, then the company deserves the kudos it will get. But it should also remain humble. With technological progress and deregulation advancing apace, repeat performances are becoming more and more challenging.

If the profitability over several years of the company's operating assets is not at least equal to the return looked for by investors, then the financial manager should discuss how to improve the situation with operational people.

(b) Of risks run by the company

Fluctuations in interest rates, currencies and the prices of raw materials are so great that financial risks are as important as industrial risks. Consider a Swiss company that buys copper in the world market, then processes it and sells it in Switzerland and abroad.

Its performance depends not only on the price of copper but also on the exchange rate of the US dollar versus the Swiss franc, because it uses the

dollar to make purchases abroad and receives payment in dollars for international sales. Lastly, interest rate fluctuations have an impact on the company's financial flows. A multi-headed dragon!

The company must manage its specific interest rate and exchange rate risks because doing nothing can also have serious consequences (see Chapter 51).

Take an example of an economy with no derivative markets. A corporate treasurer anticipating a decline in long-term interest rates and whose company has long-term debt has no choice but to borrow short term, invest the proceeds long term, wait for interest rates to decline, pay off the short-term loans and borrow again. You will have no trouble understanding that this strategy has its limits. The balance sheet becomes inflated, intermediation costs rise, and so on. Derivative markets enable the treasurer to manage this long-term interest rate risk without touching the company's balance sheet.

Generally, the CFO is responsible for the identification, the assessment and the management of risks for the firm. This includes not only currency and interest rate risks but also liquidity and counterparty risk. Recent years have shown that a CFO with strong know-how in such matters is highly appreciated.

(c) Of ESG commitments made by the company

As the spokesperson within the company for the investors who finance it, the role of the CFO is also to guarantee the sincerity of the ESG commitments made and their respect over time, because sincerity creates trust. And without trust, there is no funding.

3/ THE FINANCIAL MANAGER IS ALSO A STRATEGIST

The corporate financier is also a strategist who, because they constantly assess the risk and profitability of the company's activities, and therefore, as we shall see, their value, is in a position to suggest a review of their scope. The company will thus be able to sell to better placed third parties, assets on which it is unable over time to generate the required rate of return in view of their risks, in order to concentrate on the best performing divisions that can be developed through acquisitions.

We are far from the CFOs of the sixties who were mainly top-of-the-class accountants! Nowadays they are required not only to perfectly master accounting and finance, but also to be gifted in marketing and negotiation, not to mention tax and legal issues, risk management, and to be able managers of their teams. The best of them also have a strategic way of thinking, and their intimate knowledge of the company and its human resources allows them to be serious candidates for the top job. As an illustration, the current CEOs of Siemens, Danone, Expedia, Sony and Tata Consulting are all former CFOs of their companies.

*** * ***

We're going to leave you with these appetisers in the hope that you are now hungry for more. But beware of taking the principles briefly presented here and skipping directly to Section III of the book. If you are looking for high finance and get-rich-quick schemes, this book is definitely not for you. The menu we propose is as follows:

First, an understanding of the firm, i.e. the source of all the cash flows that are the subject of our analysis (**Section I: Financial analysis**).

Then an appreciation of markets, because it is they who are constantly valuing the firm (**Section II: Investors and markets**).

Then an understanding of how value is created and how it is measured (**Section III: Value**).

Followed by the major financial decisions of the firm, viewed in the light of both market theory, organisational and behavioural theories (**Section IV: Corporate financial policies**).

Finally, if you persevere through the foregoing, you will get to taste the dessert, as **Section V: Financial management** presents several practical, current topics in financial engineering and management.

SUMMARY

The summary of this chapter can be downloaded from www.vernimmen.com.

Financial managers (or CFOs) are evolving in an environment that is undergoing irreversible change due to the rise in environmental, social and governance (ESG) concerns within society. This change is naturally and durably affecting corporate finance, slowly in some aspects, much more rapidly in others.

It has led to a growing number of investors to define ESG criteria leading to the exclusion from their portfolios or underweighting of companies that do not comply with them. This pushes companies to take these criteria into account, and to finance through new tools, such as green or socially responsible bonds, investments aimed at better complying with ESG criteria. In the long run, a company that chooses to ignore ESG concerns would be doomed to disappear under the double effect of a higher cost of financing and difficulties in attracting talent.

The financial manager has three main roles:

To ensure the company has enough funds to finance its expansion and meet its obligations. To do this, the company issues securities (equity and debt) and the financial manager sells them to financial investors at the highest possible price. In today's capital market economy, the role of the financial manager is less a buyer of funds, with an objective to minimise cost, and more a seller of financial securities. By emphasising the financial security, we focus on its value, which combines the notions of return and risk. We thereby de-emphasise the importance of minimising the cost of financial resources, because this approach ignores the risk factor. Casting the financial manager in the role of salesperson also underlines the marketing aspect of the job, which is far from theoretical. Financial managers have customers (investors) who must be convinced to buy the securities the company issues. The better they understand their customers' needs, the more successful they will be.

To ensure the sustainability of the company in three areas: profitability, risks and compliance with ESG commitments made. The financial manager ensures that, in the medium term, the company generates a rate of return on the resources entrusted to it by the investors at least equal to the rate of return required by the latter. If this is the case, the company will create value. Otherwise, it will destroy value, leading investors, if it continues to do so, to withhold funds from it and cause the value of its securities to fall, leading to a change in management or bankruptcy. In terms of risks, the financial manager must identify and manage the company's risks so that the company's operational performance is not jeopardised by financial risks! Finally, the financial manager guarantees the company's compliance with the ESG commitments the company has made to the investors who finance it.

The financial manager is also a strategist who can be led to question the scope of the company's activities.

QUESTIONS

1/Should the unexpected announcement of a rise in interest rates automatically result in a drop in the stock market index?

2/Would your answer be the same if the announcement had been anticipated by the market? So what is the most important factor when valuing securities?

3/Other than the word “market”, what is the key word in corporate finance?

4/What can a shareholder who disagrees at all with the ESG policy of a given company do? What impact will this have on the cost of financing this business if it is not alone in acting that way?

5/You are offered a loan at 3.5% over 10 years without guarantee, and a loan at 3% over 10 years with guarantee. You need the loan. How should you go about deciding which loan to take out?

6/What can a student looking for a job who does not agree with the ESG policy of a given company do? What effect will this have on the company if this student is not alone in doing that?

7/Enel, the Italian electrician, issued a $1.5bn loan in 2019 at 5 years with a coupon of 2.65%, or 5 basis points (0.05%) below its reference curve. In the event that Enel is unable to increase the share of renewable energy from 45.9% to 55% by 2021, the coupon would be increased by 25 basis points from 2022 to 2024, representing an additional cost of $11.25 million for Enel. If Enel benefits from this 0.05% reduction in the cost of its borrowing, who bears this reduction in interest rates? Why?

8/How important is it to think in terms of an offer of and a demand for securities, and not in terms of an offer of and a demand for capital, for:

shares;

bonds;

medium-term syndicated loans;

bilateral bank loans.

Why?

9/What other financial term should immediately spring to mind when you hear the word “returns”?

10/What other financial term should immediately spring to mind when you hear the word “risk”?

11/What are the two biggest flaws of a bad financial manager?

12/Why do you believe management has to do some roadshows before issuing new shares or bonds?

13/Why would you finance a firm's investments with a very short-term loan? What would the drawback be?

You'll find more questions at www.vernimmen.com.

ANSWERS

Questions

1/As an automatic reaction, yes, as value moves in the opposite direction to interest rates.

2/The answer in this case would be no. The most important factor in valuing securities is anticipation.

3/Value.

4/If shareholders do not agree with the company's ESG policy, they may vote against certain decisions of the directors. If they are alone, their vote will have little effect. If many of them do so, shareholders may eventually obtain a change in management or strategy. Shareholders can also usefully “vote with their feet”, i.e. sell their shares! If many shareholders do this, the share price will go down. This decision will have a greater impact if executive compensation is partly linked to the share price. The corollary effect will be an increase in the cost of financing the business.

5/Is it worth providing a guarantee for a gain of 0.5%?

6/The student can choose not to join this company… and let it be known! If many students decide to turn down job offers from companies that do not act responsibly in terms of CSR, the effect will be more significant: given the shortage of talents and if the snowball effect works, these companies will eventually have to review their strategy or risk seeing their skills weaken. The student could also decide to join the company, to contribute with others to changing it from within, but this is a longer-term action and more uncertain in terms of results.

7/Investors, who do not necessarily seek to maximise their wealth at all costs, and who may want to take part in the fight against global warming by encouraging companies on the margin to carry out environmentally friendly actions, even if it means obtaining a lower return on their investments.

8/In order: 1 = very important; 2 = of moderate importance; 3 = unimportant: 1,2,2,3, because they are more or less easily traded.

9/Returns, the two are inextricably linked.

10/Risk, the two are inextricably linked.

11/Short-sightedness and poor marketing skills.

12/This is called marketing: they are trying to sell at best one product, which is a financial instrument in order to lower their cost of funding.

13/To benefit from lower interest rates (as we will see in Chapter 19, short-term interest rates are generally lower than long-term interest rates). But in that case the firm will run a strong liquidity risk as it will constantly be subject to the availability of loans on the market. The firm would probably be better off taking a long-term financing.

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NOTES

1 *See Chapter 39.*

2 *For our young readers, see the* Vernimmen.com *Newsletter,* ***28****, 7–8, November 2007 or the film* The Big Short.

3 *2018 Global Sustainable Investment Review*.

4 *AFG, the French Association of Financial Management, grouping of professionals managing portfolios on behalf of third parties, and the Forum for Socially Responsible Investment*.

5 *Are ESG tilts consistent with value creation in Europe? January 2015*.

6 *International Capital Markets Association*.

7 *See Section 21.2*.

8 *Total societal impact, a new lens for strategy,* October 2017.

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Section I
FINANCIAL ANALYSIS

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PART ONE
FUNDAMENTAL CONCEPTS IN FINANCIAL ANALYSIS

The following six chapters provide a gradual introduction to the foundations of financial analysis. They examine the concepts of cash flow, earnings, capital employed and invested capital, and look at the ways in which these concepts are linked.

They are fundamental for readers who have only a vague knowledge of the business world and basic accounting techniques. In this case, our advice is to read them and reread them before going further.

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Chapter 2
CASH FLOW

Let's work from A to Z (*unless it turns out to be Z to A!)*

Let's begin our understanding of the business by analysing the cash flows that pre-exist any accounting or management system.

Section 2.1 CLASSIFYING COMPANY CASH FLOWS

Let's consider, for example, the monthly account statement that individual customers receive from their bank. It is presented as a series of lines showing the various inflows and outflows of money on precise dates and the type of transaction (debit card payment or cash withdrawal, for instance).

Our first step is to trace the rationale for each of the entries on the statement, which could be everyday purchases, payment of a salary, automatic transfers, internet subscriptions, loan repayments or the receipt of bond interests, to mention a few examples.

The corresponding task for a financial manager is to reclassify company cash flows by category to draw up a cash flow document that can be used to:

analyse past trends in cash flow (the document put together is generally known as a cash flow statement[1]); or

project future trends in cash flow, over a shorter or longer period (the document needed is a cash flow budget or plan).

With this goal in mind, we will now demonstrate that cash flows can be classified into one of the following processes:

Activities that form part of the industrial and commercial life of a company:

- operating cycle;
- investment cycle.

Financing activities to fund these cycles:

- the debt cycle;
- the equity cycle.

Section 2.2 OPERATING AND INVESTMENT CYCLES

1/ THE IMPORTANCE OF THE OPERATING CYCLE

Let's take the example of a greengrocer, Mr G, who is “cashing up” one evening. What does he find? First, he sees how much he spent in cash at the wholesale market in the morning and then the cash proceeds from fruit and vegetable sales during the day. If we assume that the greengrocer sold all the produce he bought in the morning at a mark-up, then the balance of receipts and payments for the day will be a cash surplus.

Unfortunately, things are usually more complicated in practice. It's rare that all the goods bought in the morning are sold by the evening, especially in the case of a manufacturing business.

A company processes raw materials as part of an operating cycle, the length of which varies tremendously, from a day in the newspaper sector to seven years in the cognac sector. There is, then, a time lag between purchases of raw materials and the sale of the corresponding finished goods.

This time lag is not the only complicating factor. It is unusual for companies to buy and sell in cash. Usually, their suppliers grant them extended payment periods, and they can in turn grant their customers extended payment periods. The money received during the day does not necessarily come from sales made on the same day.

As a result of customer credit,[2] supplier credit[3] and the time it takes to manufacture and sell products or services, the operating cycle of each and every company spans a certain period, **leading to timing differences between operating outflows and the corresponding operating inflows**.

Each business has its own operating cycle of a certain length that, from a cash flow standpoint, may lead to positive or negative cash flows at different times. Operating outflows and inflows from different cycles are analysed by period, e.g. by month or by year. The balance of these flows is called **operating cash flow**. Operating cash flow reflects the cash flows generated by operations during a given period.

In concrete terms, operating cash flow represents the cash flow generated by the company's operations. Returning to our initial example of an individual looking at his bank statement, it represents the difference between the receipts and normal outgoings, such as food, electricity and rent.

Naturally, unless there is a major timing difference caused by some unusual circumstances (start-up period of a business, very strong growth, very strong seasonal fluctuations), the balance of operating receipts and payments should be positive.

Readers with accounting knowledge will note that operating cash flow is independent of any accounting policies, which makes sense since it relates only to cash flows. More specifically:

neither the company's depreciation and provisioning policy,

nor its inventory valuation method,

nor the techniques used to defer costs over several periods have any impact on the figure.

However, the concept is affected by decisions about how to classify payments between investment and operating outlays, as we will now examine more closely.

2/ INVESTMENT AND OPERATING OUTFLOWS

Let's return to the example of our greengrocer, who now decides to add frozen food to his business.

The operating cycle will no longer be the same. The greengrocer may, for instance, begin receiving deliveries once a week only and will therefore have to run much larger inventories. Admittedly, the impact of the longer operating cycle due to much larger inventories may be offset by larger credit from his suppliers. The key point here is to recognise that the operating cycle will change.

The operating cycle is different for each business and, generally speaking, the more sophisticated the end product, the longer the operating cycle.

But most importantly, before he can start up this new activity, our greengrocer needs to invest in a chest freezer.

What difference is there between this investment and operating outlays?

The outlay on the chest freezer seems to be a prerequisite. It forms the basis for a new activity, the success of which is unknown. It appears to carry higher risks and will be beneficial only if overall operating cash flow generated by the greengrocer increases. Lastly, **investments are carried out from a long-term perspective and have a longer life than that of the operating cycle**. Indeed, they last for several operating cycles, even if they do not last forever given the fast pace of technological progress.

This justifies the distinction, from a cash flow perspective, between operating and investment outflows.

Normal outflows, from an individual's perspective, differ from an investment outflow in that they afford enjoyment, whereas investment represents abstinence. As we will see, this type of decision represents one of the vital underpinnings of finance. Only the very puritanically minded would take more pleasure from buying a microwave than from spending the same amount of money at a restaurant! Only one of these choices can be an investment and the other an ordinary outflow. So, what purpose do investments serve? Investment is worthwhile only if the decision to forego normal spending, which gives instant pleasure, will subsequently lead to greater gratification.

> From a cash flow standpoint, an investment is an outlay that is subsequently expected to increase operating cash flow such that overall the individual will be happy to have forsaken instant gratification.

This is the definition of the **return on investment** (be it industrial or financial) from a cash flow standpoint. We will use this definition throughout this book.

> The purpose of investment outlays (also frequently called capital expenditures) is to alter the operating cycle, e.g. to boost or enhance the cash flows that it generates.

The impact of investment outlays is spread over several operating cycles. Financially, capital expenditures are worthwhile only if inflows generated

thanks to these expenditures exceed the outflows by an amount yielding at least the return on investment expected by the investor.

Note also that a company may sell some assets in which it has invested in the past. For instance, our greengrocer may decide after several years to trade in his freezer for a larger model. The proceeds would also be part of the investment cycle.

3/ FREE CASH FLOW

Before-tax free cash flow is defined as the difference between operating cash flow and capital expenditure net of fixed asset disposals.

As we shall see in Sections II and III of this book, free cash flow can be calculated before or after tax. It also forms the basis for the most important valuation technique. Operating cash flow is a concept that depends on how expenditure is classified between operating and investment outlays. Since this distinction is not always clear-cut, operating cash flow is not widely used in practice, with free cash flow being far more popular. If free cash flow turns negative, then additional financial resources will have to be raised to cover the company's cash flow requirements.

Section 2.3 FINANCIAL RESOURCES

The operating and investment cycles give rise to a timing difference in cash flows. Employees and suppliers have to be paid before customers settle up. Likewise, investments have to be completed before they generate any receipts. Naturally, this cash flow deficit needs to be filled. This is the role of financial resources.

The purpose of financial resources is simple: they must cover the shortfalls resulting from these timing differences by providing the company with sufficient funds to balance its cash flow.

These financial resources are provided by investors: shareholders, debtholders, lenders, etc. These financial resources are not provided with “no strings attached”. In return for providing the funds, investors expect to be subsequently rewarded by receiving dividends or interest payments, registering capital gains, etc. This can happen only if the operating and investment cycles generate positive cash flows.

To the extent that the financial investors have made the investment and operating activities possible, they expect to receive, in various different forms, their fair share of the surplus cash flows generated by these cycles.

> The financing cycle is therefore the “flip side” (the opposite in the mathematical sense) of the investment and operating cycles.

At its most basic, the principle would be to finance these treasury shortfalls solely using capital that incurs the risk of the business. Such capital is known as **shareholders' equity**. This type of financial resource forms the cornerstone of the entire financial system. Its importance is such that shareholders providing it are granted decision-making powers and control over the business in various different ways. From a cash flow standpoint, the equity cycle comprises inflows from capital increases and outflows in the form of dividend payments to the shareholders.

Like individuals, a business may decide to ask lenders rather than shareholders to help it cover a cash flow shortage. Bankers will lend funds only after they have carefully analysed the company's financial health. They want to be nearly certain of being repaid and do not want exposure to the

company's business risk. These cash flow shortages may be short term or long term, but lenders do not want to take on business risk. The capital they provide represents the company's **debt capital**.

The debt cycle is the following: the business arranges borrowings in return for a commitment to repay the capital and make interest payments regardless of trends in its operating and investment cycles. These undertakings represent firm commitments, ensuring that the lender is certain of recovering its funds provided that the commitments are met. Debt can finance:

the investment cycle, with the increase in future net receipts set to cover capital repayments and interest payments on borrowings; and

the operating cycle, with credit making it possible to bring forward certain inflows or to defer certain outflows.

From a cash flow standpoint, the life of a business comprises an operating and an investment cycle, leading to a positive or negative free cash flow. If free cash flow is negative, then the financing cycle covers the funding shortfall. But free cash flow cannot be forever negative: sooner or later investors must get a return and/or get repaid, and they can only get a return and/or get repaid by a positive free cash flow.

As the future is unknown, a distinction has to be drawn between:

equity, where the only commitment is to enable the shareholders to benefit fully from the success of the venture;

debt capital, where the only commitment is to meet the capital repayments and interest payments regardless of the success or failure of the venture.

The risk incurred by the lender is that this commitment will not be met. Theoretically speaking, debt may be regarded as an advance on future cash flows generated by the investments made and guaranteed by the company's shareholders' equity.

Although a business needs to raise funds to finance investments, it may also find, at a given point in time, that it has a cash surplus, i.e. the funds available exceed cash requirements.

These surplus funds are then invested in short-term investments and marketable securities that generate revenue, called financial income.

These investments are generally realised with a view to ensuring the possibility of a very quick exit without any risk of losses.

Although at first sight short-term financial investments (marketable securities) may be regarded as investments since they generate a rate of return, we advise readers to consider them instead as the opposite of debt. As we will see, company treasurers often have to raise additional debt even if at the same time the company holds short-term investments without speculating in any way.

Debt and short-term financial investments or marketable securities should not be considered independently of each other, but as inextricably linked. We suggest that readers **reason in terms of debt net of short-term financial investments** and **financial expense net of financial income**.

Putting all the individual pieces together, we arrive at the following simplified cash flow statement, with the balance reflecting the net decrease in the company's debt during a given period:

SIMPLIFIED CASH FLOW STATEMENT

		***n* – 2**	***n* – 1**	***n***
	Operating receipts			
−	Operating payments			
=	**Operating cash flow**			
−	Capital expenditure			
+	Fixed asset disposals			
=	**Free cash flow before tax**			
−	Financial expense net of financial income			
−	Corporate income tax			
+	Proceeds from share issue			
−	Dividends paid			
=	**Net decrease in debt**			

		***n* – 2**	***n* – 1**	***n***
	With:			
	Repayments of borrowings			
−	New bank and other borrowings			
+	Change in marketable securities			
+	Change in cash and cash equivalents			
=	**Net decrease in debt**			

This short chapter is seminal and the reader who is discovering the notions it contains for the first time should not hesitate to read it twice in order to grasp them fully.

SUMMARY

The summary of this chapter can be downloaded from www.vernimmen.com.

The cash flows of a company can be divided into four categories, i.e. operating and investment flows, which are generated as part of its business activities, and debt and equity flows, which finance these activities.

The operating cycle is characterised by a time lag between the positive and negative cash flows deriving from the length of the production process (which varies from business to business) and the commercial policy (customer and supplier credit).

Operating cash flow, the balance of funds generated by the various operating cycles in progress, comprises the cash flows generated by a company's operations during a given period. It represents the (usually positive) difference between operating receipts and payments.

From a cash flow standpoint, capital expenditures must alter the operating cycle in such a way as to generate higher operating inflows going forward than would otherwise have been the case. Capital expenditures are intended to enhance the operating cycle by enabling it to achieve a higher level of profitability in the long term. This profitability can be measured only over several operating cycles, unlike operating payments, which belong to a single cycle. As a result, investors forego immediate use of their funds in return for higher cash flows over several operating cycles.

Free cash flow can be defined as operating cash flow minus capital expenditure (investment outlays).

When a company's free cash flow is negative, it covers its funding shortfall through its financing cycle by raising equity and debt capital.

Since shareholders' equity is exposed to business risk, the returns paid on it are unpredictable and depend on the success of the venture. Where a business rounds out its financing with debt capital, it undertakes to make capital repayments and interest payments (financial expense) to its lenders regardless of the success of the venture. Accordingly, debt represents an advance on the operating receipts generated in the future

by the investment that is guaranteed by the company's shareholders' equity.

Short-term financial investment, the rationale for which differs from capital expenditures, and cash should be considered in conjunction with debt. We will always reason in terms of net debt (i.e. net of cash and of marketable securities, which are short-term financial investments) and net financial expense (i.e. net of financial income).

QUESTIONS

1/What are the four basic cycles of a company?

2/Why do we say that financial flows are the flip side of investment and operating flows?

3/Define operating cash flow. Should the company be able to spend this surplus as it likes?

4/Is operating cash flow an accounting profit?

5/Why do we say that, as a general rule, operating cash flow should be positive? Provide a simple example that demonstrates that operating cash flow can be negative during periods of strong growth, start-up periods and in the event of strong seasonal fluctuations.

6/When a cash flow budget is drawn up for the purposes of assessing an investment, can free cash flows be negative? If so, is it more likely that this will be the case at the beginning or at the end of the business plan period? Why?

7/Among the following different flows, which will be appropriated by both shareholders and lenders: operating receipts, operating cash flow, free cash flows? Who has priority, shareholders or lenders? Why?

8/A feature of a supermarket chain such as Tesco in the UK or the Dutch retailer Ahold is a very fast rotation of food stocks (six days), cash payments by customers, long supplier credit periods (45 days) and very low administrative costs. Will the operating cycle generate cash requirements or a cash surplus? What about a travel agency? Or a building materials distributor?

9/Should the cash outflows of launching a new perfume be considered as an operating outlay or an investment outlay?

10/How is an investment decision analysed from a cash standpoint?

11/After reading this chapter, can you guess how to define bankruptcy?

12/Is debt capital risk free for the lender? Can you analyse what the risk is? Why do some borrowers default on loans?

You'll find more questions at www.vernimmen.com.

EXERCISES

1/Boomwichers NV, a Dutch company financed by shareholders' equity only, decides, during the course of year *n*, to finance a new investment project worth €200m using shareholders' equity (50%) and debt (50%). The loan it takes out (€100m) will be paid off in full in *n*+5, and the company will pay 5% interest per year over the period. At the end of the period, you are asked to complete the following simplified table (no further investments are to be made):

Period	***n***	***n*+1**	***n*+2**	***n*+3**	***n*+4**	***n*+5**
Operating inflows	165	200	240	280	320	360
Operating outflows	165	175	180	185	180	190
Operating cash flows						
Investments	−200					
Free cash flows						
Flows …						
… *to creditors*						
… *to shareholders*						

What do you conclude from the above?

2/Ellingham plc opens a Greek subsidiary, which starts operating early January Y1. On 2 January it has to buy a machine costing €30m, partly financed by a €20m bank loan repayable in instalments of €2m every 15 July and 15 January over five years. Financial expenses, payable on a half-yearly basis, are as follows:

Y1		***Y2***		***Y3***		***Y4***		***Y5***	
June	Dec	June	Dec	June	Dec	June	Dec	June	Dec
1	0.9	0.8	0.7	0.6	0.5	0.4	0.3	0.2	0.1

Profits are tax free. Sales will be €12m per month. A month's inventory of finished products will have to be built up. Customers pay at 90 days.

The company is keen to have a month's worth of advance purchases and, accordingly, plans to buy two months' worth of supplies in January. Requirements in a normal month amount to €4m.

The supplier grants the company a 90-day payment period. Other costs are:

personnel costs of €4m per month;

shipping, packaging and other costs amounting to €2m per month and paid at 30 days. These costs are incurred from 1 January.

Draw up a monthly and an annual cash flow plan.

How much cash will the subsidiary need at the end of each month over the first year? And if operations are identical, how much will it need each month over the second year? What is the change in the cash position over the second year (no additional investments are planned)?

ANSWERS

Questions

1/Operating, investment, debt and equity cycles.

2/Because negative free cash flows generated by operating and investment cycles must be compensated by resources from the financial cycle. When free cash flows are positive, they are entirely absorbed by the financial cycle (debts are repaid, dividends are paid, etc.).

3/It is the balance of the operating cycle. No, as it has to repay bank debts when they are due, for example.

4/No, it is a cash flow, not an accounting profit, which we will cover in the following chapter.

5/It measures flows generated by the company's operations, i.e. its business or *raison d'être*. It is vital for the company as if it is not positive in the long term, the company may disappear. Major shortfall due to operating cycle, large inventories, operating losses on start-up, heavy swings in operating cycle.

6/Yes. At the beginning, an investment may need time to run at full speed.

7/Free cash flows, since all operating or investment outlays have been paid. The lenders, because debt represents a contractual agreement to pay interest and repay the debt capital in due time.

8/A cash surplus, as customer receipts come in before suppliers are paid. The same applies for the travel agency. A cash requirement because the building materials distributor must have a large stock to meet the varied needs of its customers who usually do not pay cash as they are not end customers.

9/Investment outlays, from which the company will benefit over several financial years as the product is being put onto the market over the long run.

10/Expenditure should generate inflows over several financial periods.

11/The inability to find additional resources to meet the company's financial obligations.

12/No. The risk is the borrowers' failure to honour contracts either because of inability to repay due to poor business conditions or because of bad faith.

Exercises

A detailed Excel version of the solutions is available at www.vernimmen.com.

1/*Boomwichers NV*

Period	***n***	***n*+1**	***n*+2**	***n*+3**	***n*+4**	***n*+5**
Operating inflows	*165*	*200*	*240*	*280*	*320*	*360*
Operating outflows	*165*	*175*	*180*	*185*	*180*	*190*
Operating cash flows	*0*	*25*	*60*	*95*	*140*	*170*
Investments	*–200*	*0*	*0*	*0*	*0*	*0*
Free cash flows	*–200*	*25*	*60*	*95*	*140*	*170*
Flows …						
… to creditors	*–100*	*5*	*5*	*5*	*5*	*105*
… to shareholders	*–100*	*20*	*55*	*90*	*135*	*65*

The investment makes it possible to repay creditors and leave cash for shareholders.

2/*Ellingham plc exercise, see page 69.*

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To learn more about cash flows:

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T. Ittelson, *Financial Statements: A Step-by-Step Guide to Understanding and Creating Financial Reports*, 3rd edn, New Page Books, 2020.

NOTES

1 *Or sometimes as a statement of changes in financial position*.

2 *That is, credit granted by the company to its customers, allowing them to pay the bill several days, weeks or, in some countries, even several months after receiving the invoice*.

3 *That is, credit granted by suppliers to the company*.

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Chapter 3
EARNINGS

Time to put our accounting hat on!

Following our analysis of company cash flows, it is time to consider the issue of how a company creates wealth. In this chapter, we are going to study the income statement to show how the various cycles of a company create wealth.

Section 3.1 ADDITIONS TO WEALTH AND DEDUCTIONS FROM WEALTH

What would your spontaneous answer be to the following questions?

Does purchasing an apartment make you richer or poorer?

Would your answer change if you were to buy the apartment on credit?

There can be no doubt as to the correct answer. Provided that you pay the market price for the apartment, your wealth is not affected whether or not you buy it on credit. Our experience as teachers has shown us that students often confuse cash and wealth.

> Cash and wealth are two of the fundamental concepts of corporate finance. It is vital to be able to juggle them around and thus be able to differentiate between them confidently.

Consequently, we advise readers to train their minds by analysing the impact of all transactions in terms of cash flows and wealth impacts.

For instance, when you buy an apartment, you become neither richer nor poorer, but your cash decreases. Arranging a loan makes you no richer or poorer than you were before (you owe the money), but your cash has increased. If a fire destroys your house and it was not insured, you are worse off, but your cash position has not changed, since you have not spent any money.

Raising debt is tantamount to increasing your financial resources and commitments at the same time. As a result, it has no impact on your net worth. Buying an apartment for cash results in a change in the nature of your assets (reduction in cash, increase in real estate assets), without any change in net worth. The possible examples are endless. **Spending money does not necessarily make you poorer. Likewise, receiving money does not necessarily make you richer.**

The job of listing all the items that positively or negatively affect a company's wealth is performed by the **income statement**,[1] which shows all the additions to wealth (**revenues**) and all the deductions from wealth (**charges or expenses or costs**). The fundamental aim of all businesses is to increase wealth. Additions to wealth cannot be achieved without some deductions from wealth. In sum, earnings represent the difference between additions to and deductions from wealth.

	Revenues		Gross additions to wealth
−	Costs	−	Gross deductions from wealth
=	Earnings	=	Net additions to wealth (deductions from)

> Earnings represent the difference between revenues and costs, leading to a change in net worth during a given period. Earnings are positive when wealth is created and negative when wealth is destroyed.

Since the rationale behind the income statement is not the same as for a cash flow statement, some cash flows do not appear on the income statement (those that neither generate nor destroy wealth). Likewise, some revenues and costs are not shown on the cash flow statement (because they have no impact on the company's cash position).

1/ EARNINGS AND THE OPERATING CYCLE

The operating cycle forms the basis of the company's wealth. It consists of both:

additions to wealth (products and services sold, i.e. products and services whose worth is recognised in the market); and

deductions from wealth (consumption of raw materials or goods for resale, use of labour, use of external services such as transportation, taxes and other duties).

The very essence of a business is to increase wealth by means of its operating cycle.

Additions to wealth		Operating revenues
Deductions from wealth	−	Cash operating costs
	=	Earnings before interest, taxes, depreciation and amortisation (EBITDA)

Put another way, the result of the operating cycle is the balance of operating revenues and cash operating costs incurred to obtain these revenues. We will refer to it as gross operating profit or EBITDA (earnings before interest, taxes, depreciation and amortisation).

It may be described as gross insofar as it covers just the operating cycle and is calculated before non-cash expenses such as depreciation and amortisation, and before interest and taxes.

2/ EARNINGS AND THE INVESTING CYCLE

(a) Principles

Investing activities do not appear directly on the income statement. In a wealth-oriented approach, an investment represents a use of funds that retains some value.

To invest is to forego liquid funds: an asset is purchased but no wealth is destroyed. As a result, investments never appear directly on the income statement.

That said, the value of investments may change over time:

it may decrease if they suffer wear and tear or become obsolete;

it may increase if the market value of certain assets rises. Most of the time, by virtue of the principle of prudence, increases in value are recorded only if realised through the disposal of the asset.[2]

(b) Accounting for a decrease in the value of fixed assets

The decrease in value of a fixed asset due to its use by the company is accounted for by means of **depreciation** and **amortisation**.[3]

Impairment losses or write-downs on fixed assets recognise the loss in value of an asset not related to its day-to-day use, i.e. the unforeseen diminution in the value of:

an intangible asset (goodwill, patents, etc.);

a tangible asset (property, plant and equipment);

an investment in a subsidiary.

Depreciation and amortisation on fixed assets are so-called “non-cash” costs insofar as they merely reflect arbitrary accounting assessments of the loss in value (which are included in operating costs) and provisions.

3/ THE DISTINCTION BETWEEN OPERATING COSTS AND FIXED ASSETS

Although we are easily able to define investment from a cash flow perspective, we recognise that our approach goes against the grain of the traditional presentation of these matters, especially as far as those familiar with accounting are concerned:

Whatever is consumed as part of the operating cycle to create something new belongs to the operating cycle. Without wishing to philosophise, we note that the act of creation always entails some form of destruction.

Whatever is used without being destroyed directly, thus retaining its value, belongs to the investment cycle. This represents an immutable asset or, in accounting terms, a fixed asset (a “non-current asset” in IFRS terminology).

For instance, to make bread, a baker uses flour, salt, yeast and water, all of which form part of the end product. The process also entails labour, which has a value only insofar as it transforms the raw material into the end product. At the same time, the baker also needs a bread oven, which is absolutely essential for the production process, but is not destroyed by it. Though this oven may experience wear and tear, it will be used many times over.

This is the major distinction that can be drawn between operating costs and fixed assets. It may look deceptively straightforward, but in practice is no clearer than the distinction between investment and operating outlays. For instance, does an advertising campaign represent a charge linked solely to one period with no impact on any other? Or does it represent the creation of an asset (a brand)?

4/ THE COMPANY'S OPERATING PROFIT

From EBITDA, which is linked to the operating cycle, we deduct non-cash costs, which comprise depreciation and amortisation and impairment losses or write-downs on fixed assets.

This gives us operating income or operating profit or EBIT (earnings before interest and taxes), which reflects the increase in wealth generated by the company's industrial and commercial activities.

Operating profit or EBIT represents the earnings generated by investment and operating cycles for a given period.

The term “operating” contrasts with the term “financial”, reflecting the distinction between the real world and the realms of finance. Indeed, operating income is the product of the company's industrial and commercial activities before its financing operations are taken into account. Operating profit or EBIT may also be called operating income, trading profit or operating result.

5/ EARNINGS AND THE FINANCING CYCLE

(a) Debt capital

Repayments of borrowings do not constitute costs but, as their name suggests, merely repayments.

Just as common sense tells us that securing a loan does not increase wealth, neither does repaying a borrowing represent a charge.

> The income statement shows only costs related to borrowings. It never shows the repayments of borrowings, which are deducted from the debt recorded on the balance sheet (without flowing through the income statement).

We emphasise this point because our experience tells us that many mistakes are made in this area.

Conversely, we should note that the interest payments made on borrowings lead to a decrease in the wealth of the company and thus represent an expense for the company. As a result, they are shown on the income statement.

Similarly, when a company invests cash in financial products (money market funds, interest-bearing accounts), the interest received is recognised as financial income. The difference between financial income and financial expense is called **net financial expense/(income)**.

The difference between operating profit and net financial expense is called **profit before tax and non-recurring items**.[4]

(b) Shareholders' equity

From a cash flow standpoint, shareholders' equity is formed through issuance of shares minus outflows in the form of dividends or share buy-backs. These cash inflows give rise to ownership rights over the company. The income statement measures the creation of wealth by the company; it therefore naturally ends with the net earnings (also called net profit). Whether the net earnings are paid in dividends or not is a simple choice of cash position made by the shareholder.

If we take a step back, we see that net earnings and financial interest are based on the same principle of distributing the wealth created by the company. Likewise, income tax represents earnings paid to the state in spite of the fact that it does not contribute any funds to the company.

6/ RECURRENT AND NON-RECURRENT ITEMS: EXTRAORDINARY AND EXCEPTIONAL ITEMS, DISCONTINUED OPERATIONS

We have now considered all the operations of a business that may be allocated to the operating, investing and financing cycles of a company. That said, it is not hard to imagine the difficulties involved in classifying the financial consequences of certain **extraordinary** events, such as losses incurred as a result of earthquakes, other natural disasters or the expropriation of assets by a government.

They are not expected to occur frequently or regularly and are beyond the control of a company's management – hence, the idea of creating a separate catch-all category for precisely such extraordinary items.

We will see in Chapter 9 that the distinction between non-recurring and recurring items is a difficult and subjective distinction, all the more so as accounting standards do little to help us.

Among the many different types of **exceptional** events, we will briefly focus on asset disposals. Investing forms an integral part of the industrial and commercial activities of businesses. But the best-laid plans may fail, while others may lead down a strategic impasse.

Put another way, disinvesting is also a key part of an entrepreneur's activities. It generates exceptional “asset disposal” inflows on the cash flow statement and capital gains and losses on the income statement, which may appear under exceptional items or not. It is for the analyst to decide whether these gains and losses are recurring, and thus part of the operations; or not, and then constitute non-recurring items. More generally, some non-recurring items have a cash impact, some have none (goodwill depreciation, for example).

By definition, it is easier to analyse and forecast profit before tax and non-recurrent items than **net income or net profit**, which is calculated after the impact of non-recurrent items and tax.

7/ NET INCOME

Net income measures the creation or destruction of wealth during the fiscal year. Net income is a wealth indicator, not a cash indicator. It incorporates wealth-destructive items like depreciation, which are non-cash items, and most of the time it does not show increases in value, which are only recorded when they are realised through asset sales.

Section 3.2 DIFFERENT INCOME STATEMENT FORMATS

Two main formats of income statement are frequently used, which differ in the way they present revenues and expenses related to the operating and investment cycles. They may be presented either:

by function,[5] i.e. according to the way revenues and costs are used in the operating and investing cycle. This shows the cost of goods sold, selling and marketing costs, research and development costs and general and administrative costs; or

by nature,[6] i.e. by type of expenditure or revenue, which shows the change in inventories of finished goods and in work in progress (closing minus opening inventory), purchases of and changes in inventories of goods for resale and raw materials (closing minus opening inventory), other external costs, personnel expenses, taxes and other duties, depreciation and amortisation.

> Thankfully, operating profit works out to be the same, irrespective of the format used!

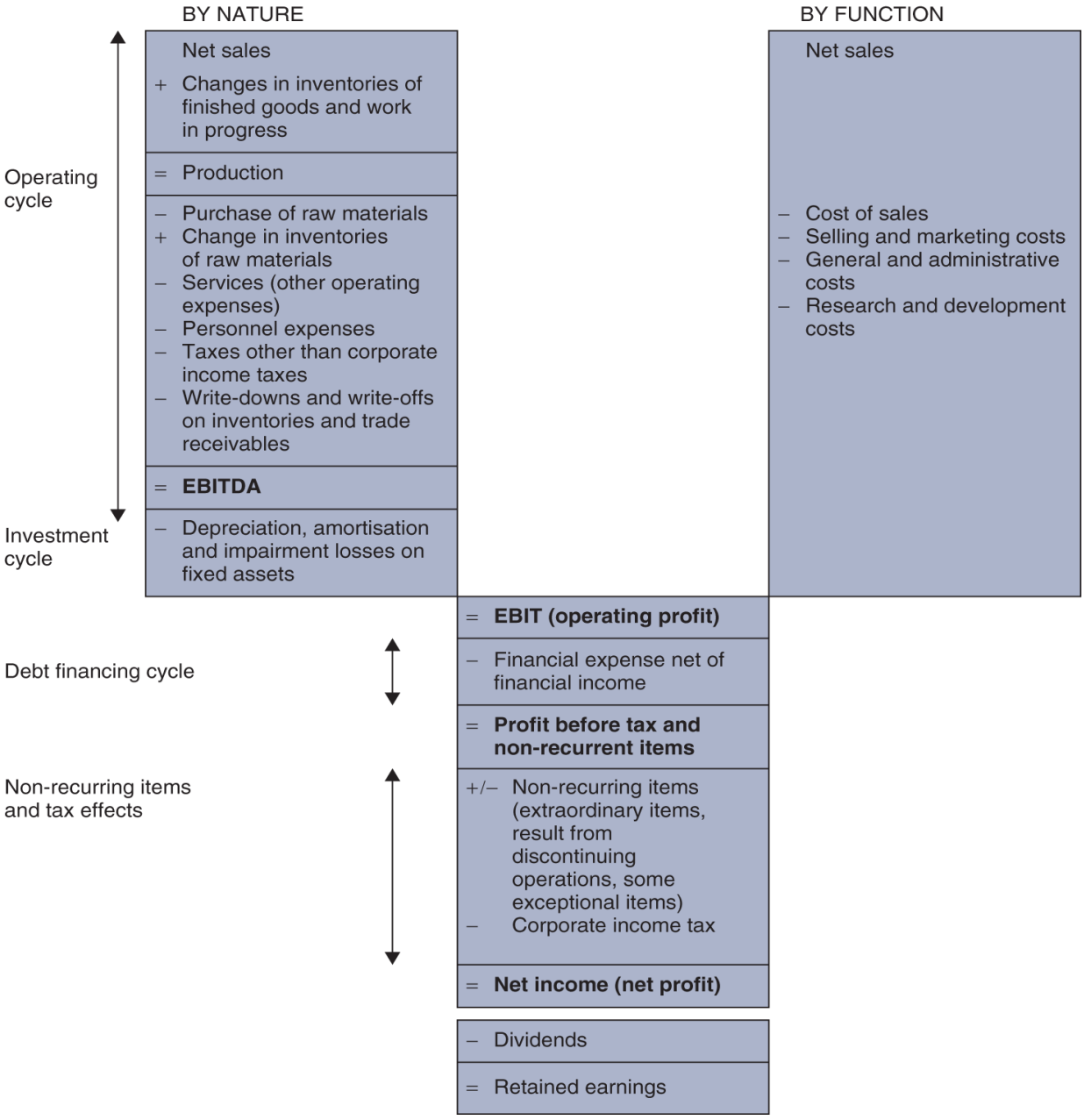
Presentation	China	France	Germany	India	Italy	Japan	Morocco	Russia	Switzerland	UK	US
By nature	0%	23%	30%	100%	66%	10%	100%	21%	27%	10%	0%
By function	92%	53%	67%	0%	27%	90%	0%	75%	66%	90%	60%
Other	8%	23%	3%	0%	7%	0%	0%	4%	7%	0%	40%

Source: 2020 annual reports from the top 30 listed non-financial groups in each country

The by-nature presentation predominates to a great extent in Italy, India and Morocco. In the US, the by-function presentation is largely predominant.[7]

Whereas in the past, France, Germany and Switzerland tended to use systematically the by-nature or by-function format, the current situation is less clear-cut. Moreover, a new presentation is making some headway; it is mainly a by-function format but depreciation and amortisation are not included in the cost of goods sold, in selling and marketing costs or research and development costs, but are isolated on a separate line.

The two different income statement formats can be summarised by the following diagram:



1/ THE BY-FUNCTION INCOME STATEMENT FORMAT

This presentation is based on a management accounting approach, in which costs are allocated to the main corporate functions:

Function	Corresponding cost
Production	Cost of sales, or cost of goods sold
Commercial	Selling and marketing costs
Research and development	Research and development costs
Administration	General and administrative costs

As a result, personnel expense is allocated to each of these four categories (or three where selling, general and administrative costs are pooled into a single category), depending on whether an individual employee works in production, sales, research or administration. Likewise, depreciation expense for a tangible fixed asset is accounted for under cost of goods sold if it relates to production machinery, to selling and marketing costs if it concerns a car used by the sales team, to research and development costs if it relates to laboratory equipment, or to general and administrative costs in the case of the accounting department's computers, for example.

The underlying principle is very simple indeed. This format clearly shows that operating profit is the difference between sales and the cost of sales irrespective of their nature (i.e. production, sales, research and development, administration).

On the other hand, it does not differentiate between the operating and investment processes, since depreciation and amortisation is not shown directly on the income statement (it is split up between the four main corporate functions), obliging analysts to track down the information in the cash flow statement or in the notes to the accounts.

2/ THE BY-NATURE INCOME STATEMENT FORMAT

The by-nature format is simple to apply, even for small companies, because no allocation of expenses is required. It offers a more detailed breakdown of costs.

Naturally, as in the previous approach, operating profit is still the difference between sales and the cost of sales.

In this format, costs are recognised as they are incurred rather than when the corresponding items are used. Showing on the income statement all purchases made and all invoices sent to customers during the same period would not be comparing like with like.

A business may transfer to inventory some of the purchases made during a given year. The transfer of these purchases to inventory does not destroy any wealth. Instead, it represents the formation of an asset, albeit probably a temporary one, but one that has real value at a given point in time. Secondly, some of the end products produced by the company may not be sold during the year and yet the corresponding costs appear on the income statement.

To compare like with like, it is necessary to:

eliminate changes in inventories of raw materials and goods for resale from purchases to get raw materials and goods for resale that were used rather than simply purchased;

add changes in the inventory of finished products and work in progress back to sales. As a result, the income statement shows **production** rather than just sales.

The by-nature format shows the amount spent on production for the period and not the total expenses under the accruals convention. It has the logical disadvantage that it seems to imply that changes in inventory are a revenue or an expense in their own right, which they are not. They are only an adjustment to purchases to obtain relevant costs.

Exercise 1 will help readers get to grips with the concept of changes in inventories of finished goods and work in progress.

To sum up, there are two different income statement formats:

the by-nature format, which is focused on production, in which all the costs incurred during a given period are recorded. This amount then needs to be adjusted (for changes in inventories) so that it may be compared with products sold during the period;

the by-function format, which is built directly in terms of the cost price of goods or services sold.

Either way, it is worth noting that EBITDA depends heavily on the inventory valuation methods used by the business. This emphasises the appeal of the by-nature format, which shows inventory changes on a separate line of the income statement and thus clearly indicates their order of magnitude.

Like operating cash flow, EBITDA is not influenced by the valuation methods applied to tangible and intangible fixed assets or the taxation system.

SUMMARY

The summary of this chapter can be downloaded from www.vernimmen.com.

A distinction needs to be made between cash and wealth. Spending money does not necessarily make you poorer and neither does receiving money necessarily make you any richer. Additions to wealth or deductions from wealth by a company are measured on the income statement. They are the difference between revenues and costs that increase a company's net worth during a given period.

From an accounting standpoint, operating costs reflect what is used up immediately in the operating cycle and somehow forms part of the end product. On the contrary, fixed assets are not destroyed directly during the production process and retain some of their value.

EBITDA (earnings before interest, taxes, depreciation and amortisation) shows the profit generated by the operating cycle (operating revenues − operating costs).

As part of the operating cycle, a business naturally builds up inventories, which are assets. These represent costs, the impact of which needs to be eliminated in the calculation of EBITDA. In the by-nature format, this adjustment is made to operating revenues (by adding back changes in finished goods inventories) and to operating costs (by subtracting changes in inventories of raw materials and goods for resale from purchases). The by-function income statement shows merely sales and the cost of goods sold requiring no adjustment.

Capital expenditures never appear directly on the income statement, but they lead to an increase in the amount of fixed assets held. That said, an accounting assessment of impairment in the value of these investments over time leads to non-cash expenses, which are shown on the income statement (depreciation, amortisation and impairment losses on fixed assets).

EBIT (earnings before interest and taxes) shows the profit generated by the operating and investment cycles. In concrete terms, it represents the profit generated by the industrial and commercial activities of a business. It is allocated to:

financial expense: only costs related to borrowings appear on the income statement, since capital repayments do not represent a destruction of wealth;

corporate income tax;

net income that is distributed to shareholders as dividends and/or transferred to the reserves (as retained earnings).

Transactions that do not fit into the other categories are included under non-recurring income.

QUESTIONS

1/A company raises €500m in shareholders' equity for an R&D project. Has it become richer or poorer? By how much? What is your answer if the company spends half of the funds in the first two years, and the project does not produce results? In the third year, the company uses the remaining funds to acquire a competitor that is overvalued by 25%. But thanks to synergies with this new subsidiary, it is able to improve its earnings by €75m during this third year. Has it become richer or poorer? By how much?

2/What are the accounting items corresponding to additions to wealth for shareholders, lenders and the state?

3/In concrete terms, based on the diagram on page 37, by how much does a company create wealth over a given financial period? Why?

4/Comment on the following two statements: “This year, we're going to have to go into debt to cover our losses” and “We'll be able to buy out our main competitor, thanks to the profits we made this year”.

5/In 2020, a company's free cash flow turns negative. Has the company created or destroyed wealth?

6/Does EBITDA always flow directly into a company's bank account?

7/Is it correct to say that a company's wealth is increased each year by the amount of EBITDA?

8/According to the terminology used in Chapter 2, is depreciation a cash outflow or a cost? What is the difference between these two concepts?

9/Analyse the similarities and the differences between cash and wealth, looking at, for example, investment in real estate and investment in research.

10/Will repayment of a loan always be recorded on the income statement? Will it always be recorded under a cash item?

11/Does the inflation-related increase in the nominal value of an asset appear on the income statement?

12/Why is the increase in inventories of raw materials deducted from purchases in the by-nature income statement format?

13/Why is change in finished goods inventories recorded under income in the by-nature income statement format?

14/Should the sale of a fixed asset be classified as part of the “ordinary course of business” of a company? How is it recorded on the income statement? Why under this heading?

15/Provide several examples illustrating the difference between cash receipts and revenues, cash expenses and costs.

16/What is a non-cash expense? What is a deferred charge? Describe their similarities and the differences between them.

You'll find more questions at www.vernimmen.com.

EXERCISES

1/Starjö AB

You are asked by a Swedish company that assembles computers to draw up a by-nature and by-function income statement for year *n*. You are provided with the following information:

Retail price of a PC: €1,500.

Cost of various components:

Parts	Price (in €)	Opening inventory	Closing inventory
Case	50	5	13
Motherboard	200	8	2
Processor	300	4	11
Memory	100	6	4
Graphics card	50	1	13
Hard disk	150	5	10
Screen	200	3	3
Blu-ray combo	50	7	19

Over the financial period, the company paid out €60,000 in salaries and social security contributions of 50% of that amount. The company produced 240 PCs. Closing stock of finished products was 27 units and opening stock 14 units.

At the end of the financial period, the manager of the company sells the premises that they had bought for €200,000 three years ago (which was depreciated over 40 years) for €230,000, it now occupies old premises that are fully depreciated, and pays off a €12,000 loan on which the company was paying interest at 5%. What impact do these transactions have on EBITDA, operating profit and net income? Tax is levied at a rate of 35%.

Over the course of the financial period, by how much did the company/the lenders/the company manager (who owns 50% of the shares) get richer/poorer?

2/Ellingham plc

Draw up the income statement for Y1 in both the by-nature and by-function formats. Depreciation and amortisation come to €6m.

3/Mumbai Oaks

Consider an Indian business that sells oak barrels to vineyards. At the start of the year, its inventory of finished products was zero. It sold 800 of the 900 barrels it had produced, leaving the closing inventory at 100 barrels. Each barrel sells for INR 10,000. To produce one barrel, the company spends INR 5,000 on oak purchases and incurs INR 2,000 in labour costs. In addition, the sales force generates costs of INR 450,000 per year and the fully outsourced administrative department incurs costs of INR 400,000 p.a.. Annual depreciation expense related to the production facilities comes to INR 300,000. The opening inventory of raw materials was INR 400,000 and the closing inventory INR 500,000. In sum, the business spent INR 4,600,000 on raw materials.

Produce the by-nature income statement.

Assuming that depreciation breaks down into INR 200,000 for the production machinery, INR 70,000 for the sales facilities and INR 30,000 for the administrative facilities, produce the by-function income statement. Are you surprised that both formats give the same EBIT? Why? What do you think about Mumbai Oaks's EBIT margin?

4/Singapore Kite Surf Magazine

You want to launch the first kitesurfing monthly magazine in Singapore. The economics are the following:

for each issue you need to pay some friends for the articles ($2,000 paid each month including social insurance charges);

the magazine will be sold only by subscription, you know the universe of buyers and you believe you can sell 1,500 subscriptions (no additional sales are expected in the short term);

fabrication and delivery costs are $2 per magazine;

you believe you can sell the yearly subscription at $50;

you should benefit from income tax exemption for the first two years of operations.

You launch your project in September. You close your accounts in December. What will your income statement and cash flow statement be for your first two financial years?

How can you finance your project?

ANSWERS

Questions

1/Neither. Zero, poorer by €250m. Richer this year by €25m: 75 – 250 × [25% / (1 + 25%)].

2/Net income, financial expenses, corporate income tax.

3/EBIT (operating profit) + non-recurring items – corporate income tax. The wealth created is the wealth to be divided up between lenders (financial expenses), the state (corporate income tax) and shareholders (the balance).

4/Confusion between additions to and deductions from wealth (which is an accounting issue) and cash: in the former, new borrowings do not add wealth to cover the losses; in the latter, profit is not the means used to finance an investment as it does not translate 100% in cash.

5/There is nothing that tells us whether wealth has been destroyed or created as we do not know what net income for 2014 is.

6/No, because income and costs may not necessarily correspond to immediate cash receipts or expenses.

7/No, because a company takes on costs that are deductible from EBITDA to form net income – depreciation, financial costs, etc.

8/It is a non-cash charge, not a cash expense, i.e. a cost that is recorded, but which does not have to be cashed out.

9/From a cash standpoint, an investment in real estate is a cash expense which will only generate income on the day it is sold. From a wealth standpoint, real estate is an attractive asset. For investments in R&D, returns must be quicker from a cash standpoint. In terms of wealth, however, the disposal value of R&D is nil.

10/No, only financial interest is recorded in the income statement. Yes, because debts are repaid in cash.

11/No, because of the prudence principle.

12/In order to obtain a figure for purchases consumed in the business in the current year.

13/In order to counterbalance costs recorded in the income statement, which should not affect this year's net income as they are related to unsold products.

14/No, except if the company is in the business of regularly selling fixed assets, like a car rental company, for example. Capital gains or losses on the sale of a fixed asset will be recorded as exceptional gains/losses (if this category exists in the accounting system).

15/Sales (revenues) and customer payments (cash receipts). Depreciation and amortisation (costs without cash expenses). Purchase of a machine (cash expense but not a charge), depreciation of this machine (cost but not a cash expense).

16/A non-cash expense is a charge which does not reflect a specific expense, but an accounting and arbitrary valuation of how much wealth has been destroyed. A deferred charge is one that is carried over to the next financial period. Common point: both are based on an accounting decision, resulting in a dilemma for the financial manager: have they been measured properly?

Exercises

A detailed Excel version of the solutions is available at www.vernimmen.com.

1/ *Starjö AB*

Production sold	*340,500*	*Sales*	*340,500*
Change in finished goods and in-progress inventory	*19,175*		
Purchases of raw materials and goods for resale	*267,050*		
Change in raw materials and goods for resale	*3,050*		
Personnel costs, including payroll taxes	*90,000*		
Other purchases and external costs, including lease payments	*0*		
EBITDA	*5,675*		
Depreciation and amortisation	*5,000*	*Cost of goods sold*	*339,825*
EBIT		*675*	
Net interest and other financial costs		*600*	
Non-recurring items		*45,000*	
Tax		*15,776*	
Net earnings		*29,299*	

Sale of premises: capital gain of €45,000 shown as a non-recurring item gain.

Rental of premises: extra €12,000 in operating costs (recorded under "Other purchases and external costs") and disappearance of depreciation and amortisation the following year.

Repayment of the loan: disappearance of €600 in interest expenses the following financial year.

Over the course of the financial year, and after booking these transactions, the company became richer by €29,299 (after tax), the creditors by €600 and the company manager by €14,649.

2/*Ellingham plc: see Chapter 5.*

3/*Mumbai Oaks*

By-nature income statement:		
Net sales	800 × INR 10,000 = 8,000,000	
+ Closing inventory of finished products	*100 × (5,000 + 7,000) = 1,700,000*	+ Changes in inventories of finished goods and work in progress
− Opening inventory and work in progress	*− 0*	
= *Production for the year*	*8,700,000*	
− *Purchases of raw materials and goods for resale*	*− 4,600,000*	
− *Opening inventory of raw materials and goods for resale*	*− 400,000*	*= Raw materials and goods for resale consumed*
+ *Closing inventory of raw materials and goods for resale*	*+ 500,000*	
= *Gross profit on raw materials and goods for resale used*	*4,200,000*	
− *Personnel expenses*	*900 × INR 2,000 + INR 450,000 = −2,250,000*	
− *Services (other operating expenses)*	*− 400,000*	
− *Depreciation and amortisation*	*− 300,000*	
= *EBIT (operating profit)*	*1,250,000*	
***By-function income statement*:**		
Sales (products)	*800 units × 10,000 = INR 8,000,000*	
Cost of sales	*200,000 + 800 units × 7,000 = INR 5,800,000*	
Selling and marketing costs	*70,000 + 450,000 = INR 520,000*	
General and administrative costs	*30,000 + 400,000 = INR 430,000*	
EBIT (operating profit)	*INR 1,250,000*	

This corresponds exactly to the gross margin per unit of INR 3,000 multiplied by the 800 units sold minus fixed costs of INR 450,000 (sales force), INR 400,000 (administration) and INR 300,000 (depreciation).

As by-nature and by-function formats differ only by presentation and not substance, it is quite logical that the different formats do not lead to a difference in reported EBIT!

Achieving an EBIT of INR 1,250,000 out of a turnover of INR 8,000,000 is a very nice margin (15.6%). Most industrial groups do not achieve this kind of margin. This may be due to the fact that in most small companies, owners prefer to be paid a low wage and receive higher dividends, which are generally taxed at a lower rate than ordinary salaries.

4/*Singapore Kite Surf Magazine*

Income statement:

	FY$_1$	**FY$_2$**
Sales	*50 × 1,500/3 = 25,000*	*50 × 1,500 = 75,000*
Personnel cost	*4 × 2,000 = 8,000*	*12 × 2,000 = 24,000*
Fabrication and distribution	*1,500 × 2 × 4 = 12,000*	*1,500 × 2 × 12 = 36,000*
Net income	*5,000*	*15,000*
Cash flow statement:		
	FY$_1$	**FY$_2$**
Operating cash inflow	*50 × 1,500 = 75,000*	*50 × 1,500 = 75,000*
Operating cash outflow	*4 × 2,000 + 1,500 × 2 × 4 = 20,000*	*12 × 2,000 + 1,500 × 2 × 12 = 60,000*
Cash flow from operations	*55,000*	*15,000*

If you can convince your clients to pay their subscription before they get the first issue, they will basically finance the project!

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NOTES

1 *Also called a Profit and Loss statement or P&L account.*

2 *But IFRS have created some exceptions to this principle that we will see in Chapters 6 and 7.*

3 *Amortisation is sometimes used instead of depreciation, particularly in the context of intangible assets.*

4 *Or non-recurrent items*.

5 *Also called by-destination income statement*.

6 *Also called by-category income statement*.

7 *The US airline companies are an exception as most of them use the by-nature income statement*.

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Chapter 4
CAPITAL EMPLOYED AND INVESTED CAPITAL

The end-of-period snapshot

So far in our analysis, we have looked at inflows and outflows, or revenues and costs during a given period. We will now temporarily set aside this dynamic approach and place ourselves at the end of the period (rather than considering changes over a given period) and analyse the balances outstanding.

For instance, in addition to changes in net debt over a period, we also need to analyse net debt at a given point in time. Likewise, we will study here the wealth that has been accumulated up to a given point in time, rather than that generated over a period.

The balance represents a snapshot of the cumulative inflows and outflows previously generated by the business.

To summarise, we can make the following connections:

an inflow or outflow represents a change in “stock”, i.e. in the balance outstanding;

a “stock” is the sum of inflows and outflows since a given date (when the business started up) through to a given point in time. For instance, at any moment, shareholders' equity is equal to the sum of capital increases (net of capital decreases) by shareholders and annual net income for past years not distributed in the form of dividends plus the original share capital.

Section 4.1 THE BALANCE SHEET: DEFINITIONS AND CONCEPTS

The purpose of a balance sheet is to list all the assets of a business and all of its financial resources at a given point in time.

1/ MAIN ITEMS ON A BALANCE SHEET

Assets on the balance sheet comprise:

fixed assets,[1] i.e. everything required for the operating cycle that is not destroyed as part of it. These items retain some value (any loss in their value is accounted for through depreciation, amortisation and impairment losses). A distinction is drawn between **tangible fixed assets** (land, buildings, machinery, etc.),[2]**intangible fixed assets** (brands, patents, software, goodwill, etc.) and **investments**. When a business holds shares in another company (in the long term), they are accounted for under investments;

inventories and trade receivables, i.e. temporary assets created as part of the operating cycle;

lastly, marketable securities and cash that belong to the company and are thus assets.

Inventories, receivables,[3] marketable securities and cash represent the **current assets**, a term reflecting the fact that these assets tend to "turn over" during the operating cycle.

Resources on the balance sheet comprise:

capital provided by shareholders, plus retained earnings, known as **shareholders' equity**;

borrowings of any kind that the business may have arranged, e.g. bank loans, supplier credits, etc., known as **liabilities**.

THE BALANCE SHEET

	SHAREHOLDERS' EQUITY
FIXED ASSETS	

(or NON-CURRENT ASSETS)	
	LIABILITIES
CURRENT ASSETS	

By definition, a company's assets and resources must be exactly equal. This is the fundamental principle of double-entry accounting. When an item is purchased, it is either capitalised or expensed. If it is capitalised, it will appear on the asset side of the balance sheet, and if expensed, it will lead to a reduction in earnings and thus shareholders' equity. The double-entry for this purchase is either a reduction in cash (i.e. a decrease in an asset) or a commitment (i.e. a liability) to the vendor (i.e. an increase in a liability). According to the algebra of accounting, assets and resources (equity and liabilities) always carry the opposite sign, so the equilibrium of the balance sheet is always maintained.

It is European practice to classify assets starting with fixed assets and to end with cash,[4] whereas it is North American and Japanese practice to start with cash. The same is true for the equity and liabilities side of the balance sheet: Europeans start with equity, whereas North Americans and Japanese end with it.

A “horizontal” format is common in continental Europe, with assets on the left and resources on the right. In the UK, the more common format is a “vertical” one, starting from fixed assets plus current assets and deducting liabilities to end up with equity. These are only choices of presentation.

2/ TWO WAYS OF ANALYSING THE BALANCE SHEET

A balance sheet can be analysed either from a capital-employed perspective or from a solvency-and-liquidity perspective.

In the capital-employed analysis, the balance sheet shows all the uses of funds for the company's operating cycle and analyses the origin of its sources of funds.

A capital-employed analysis of the balance sheet serves three main purposes:

to illustrate how a company finances its operating assets (see Chapter 12);

to compute the rate of return either on capital employed or on equity (see Chapter 13); and

as a first step to valuing the equity of a company as a going concern (see Chapter 31).

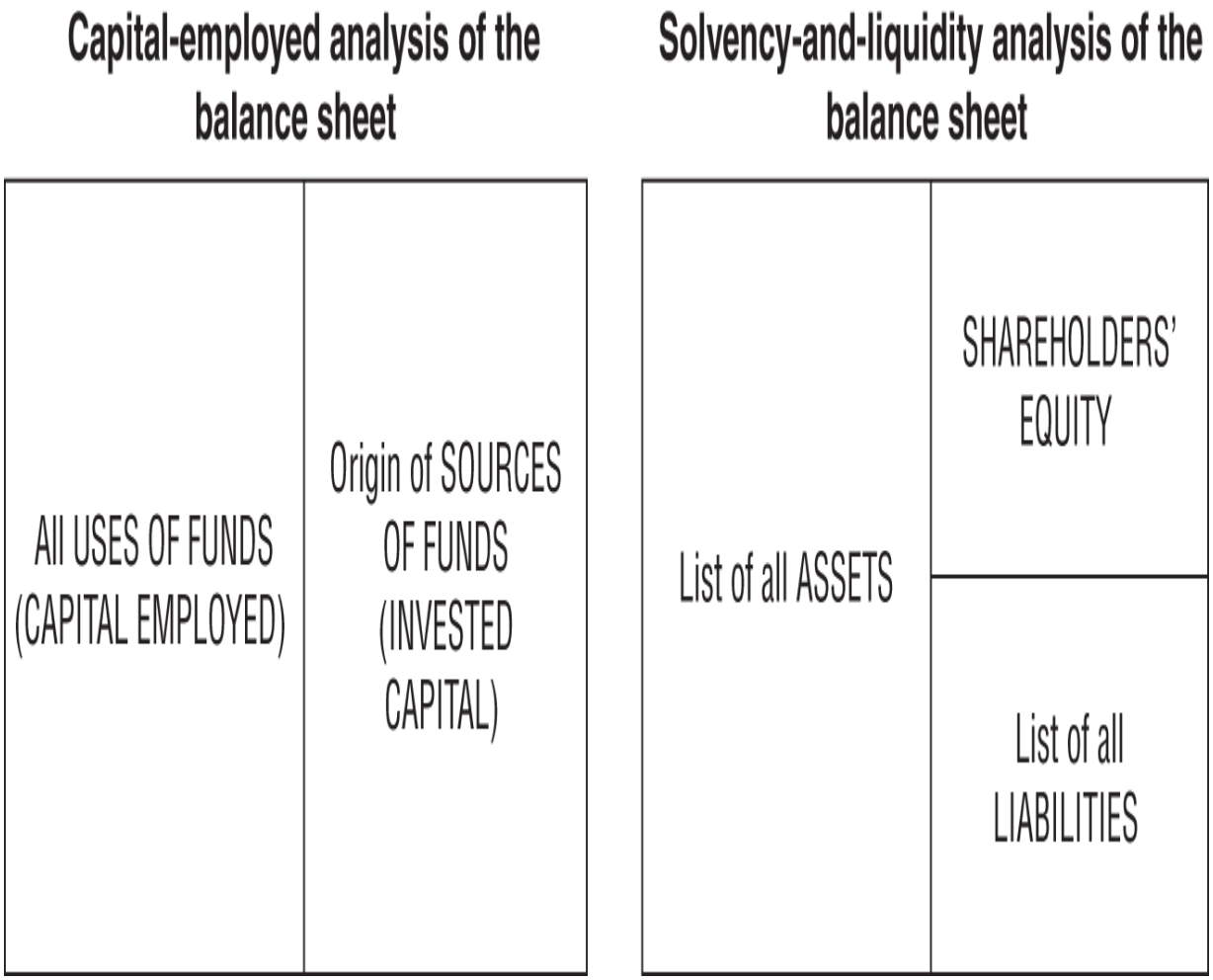
In a solvency-and-liquidity analysis, a business is regarded as a set of assets and liabilities, the difference between them representing the book value of the equity provided by shareholders. From this perspective, the balance sheet lists everything that a company owns and everything that it owes.

A solvency-and-liquidity analysis of the balance sheet serves three purposes:

to measure the solvency of a company (see Chapter 14);

to measure the liquidity of a company (see Chapter 12); and

as a first step to valuing its equity in a bankruptcy scenario.



Section 4.2 A CAPITAL-EMPLOYED ANALYSIS OF THE BALANCE SHEET

To gain a firm understanding of the capital-employed analysis of the balance sheet, we believe it is best approached in the same way as the analysis in the previous chapter, except that here we will be considering "stocks" rather than inflows and outflows.

> The purpose of a capital-employed analysis of the balance sheet is to analyse the capital employed in the operating cycle and how this capital is financed.

More specifically, in a capital-employed analysis, a balance sheet is divided into the following main headings.

1/ FIXED ASSETS, ALSO CALLED NON-CURRENT ASSETS

These represent all the investments carried out by the business, based on our financial and accounting definition. In IFRS and US GAAP it would also include operating lease right of use assets.

It is helpful to distinguish wherever possible between operating assets and non-operating assets that have nothing to do with the company's business activities, e.g. land, buildings and subsidiaries active in significantly different or non-core businesses. Non-operating assets can thus be excluded from the company's capital employed. By isolating non-operating assets, we can assess the resources the company may be able to call upon in hard times (i.e. through the disposal of non-operating assets).

The difference between operating and non-operating assets can be subtle in certain circumstances. For instance, how should a company's head office on Bond Street or on the Champs-Elysées be classified? Probably under operating assets for a fashion house or a car manufacturer, but under non-operating assets for an engineering or construction group which has no business reason to be on Bond Street (unlike Burberry).

2/ OPERATING WORKING CAPITAL

Operating working capital is the difference between uses of funds and sources of funds linked to the daily operations of a company.

Uses of funds comprise all the operating costs incurred but not yet used or sold (i.e. inventories) and all sales that have not yet been paid for (trade receivables).

Sources of funds comprise all charges incurred but not yet paid for (trade payables, social security and tax payables), as well as operating revenues from products that have not yet been delivered (advance payments on orders).

The net balance of operating uses and sources of funds is called the **working capital**.

If uses of funds exceed sources of funds, the balance is positive and working capital needs to be financed. This is the most frequent case. If negative, it represents a source of funds generated by the operating cycle. This is a nice – but rare – situation!

It is described as “working capital” because the figure reflects the cash required to cover financing shortfalls arising from day-to-day operations.

Sometimes working capital is defined as current assets minus current liabilities. This definition corresponds to our working capital definition + marketable securities and net cash – short-term financial and banking borrowings. We think that this is an improper definition of working capital as it mixes items from the operating cycle (inventories, receivables, payables) and items from the financing cycle (marketable securities, net cash and short-term bank and financial borrowings). You may also find in some documents expressions such as “working capital needs” or “requirements in working capital”. These are synonyms for working capital.

Operating working capital comprises the following accounting entries:

	Inventories	Raw materials, goods for resale, products and work in progress, finished products
+	**Trade receivables**	Amounts owed by customers, prepayments to suppliers and other trade receivables
−	**Trade payables**	Amounts owed to trade suppliers, social security and tax payables, prepayments by customers and other trade payables
=	**Operating working capital**	

Only the normal amount of operating sources of funds is included in calculations of operating working capital. Unusually long payment periods granted by suppliers should not be included as a component of normal operating working capital.

Where it is permanent, the abnormal portion should be treated as a source of cash, with the suppliers thus being considered as playing the role of the company's banker.

Inventories of raw materials and goods for resale should be included only at their normal amount. Under no circumstances should an unusually large figure for inventories of raw materials and goods for resale be included in the calculation of operating working capital.

Where appropriate, the excess portion of inventories or the amount considered as inventory held for speculative purposes can be treated as a high-risk short-term investment.

Working capital is totally independent of the methods used to value fixed assets, depreciation, amortisation and impairment losses on fixed assets. However, it is influenced by:

inventory valuation methods;

deferred income and cost over one or more years (accruals);

the company's provisioning policy for current assets and operating liabilities and costs.

As we shall see in Chapter 5, working capital represents a key principle of financial analysis.

3/ NON-OPERATING WORKING CAPITAL

Although we have considered the timing differences between inflows and outflows that arise during the operating cycle, we have, until now, always assumed that capital expenditures are paid for when purchased and that non-recurring costs are paid for when they are recognised in the income statement. Naturally, there may be timing differences here, giving rise to what is known as **non-operating working capital**.

Non-operating working capital, which is not a very robust concept from a theoretical perspective, is hard to predict and to analyse because it depends on individual transactions, unlike operating working capital, which is recurring.

In practice, non-operating working capital is a catch-all category for items that cannot be classified anywhere else. It includes amounts due on fixed assets, extraordinary items, etc.

4/ CAPITAL EMPLOYED

Capital employed is the sum of a company's fixed assets and its working capital (i.e. operating and non-operating working capital). It is therefore equal to the sum of the net amounts devoted by a business to both the operating and investing cycles. It is also known as **operating assets**.

Capital employed is financed by two main types of funds: shareholders' equity and net debt, sometimes grouped together under the heading of **invested capital**.

5/ FINANCIAL RESOURCES OR INVESTED CAPITAL

Capital employed is financed by two financial resources: shareholders' equity and net debt.

Shareholders' equity comprises capital provided by shareholders when the company is initially formed and at subsequent capital increases, as well as capital left at the company's disposal in the form of earnings transferred to the reserves.

The company's gross debt comprises **debt financing**, irrespective of its maturity, i.e. medium- and long-term (various borrowings due in more than one year that have not yet been repaid), and short-term bank or financial borrowings (portion of long-term borrowings due in less than one year, discounted notes, bank overdrafts, etc.) to which IFRS and US GAAP add operating lease liabilities. A company's **net debt** goes further by deducting cash and equivalents (e.g. petty cash and bank accounts) and marketable securities, which are the opposite of debt (the company lending money to banks or financial markets), that could be used to partially or totally reduce the gross debt. It is also called **net financial position**.

Net debt, or net financial position, can thus be calculated as follows:

	Medium- and long-term bank and other borrowings (bond issues, commitment under finance lease, etc.)
+	Short-term bank or financial borrowings (discounted notes, overdrafts, revolving credit facility, etc.)
−	Marketable securities (marketable securities)
−	Cash and equivalents (petty cash and bank accounts)
=	Net debt

A company's net debt can be either positive or negative. If it is negative, the company is said to have net cash.

In the previous paragraphs, we looked at the key accounting items, but some are a bit more complex to allocate (pensions, accruals, etc.) and we will develop these in Chapter 7.

From a capital-employed standpoint, a company balance sheet can be analysed as follows, with the example of the ArcelorMittal group, the world steel leader. This balance sheet will be used in future chapters.

BALANCE SHEET FOR ARCELORMITTAL

	in $m	2016	2017	2018	2019	2020
	Goodwill	5,651	5,737	5,728	5,432	4,312
+	Other intangible fixed assets	49	–	–	–	–
+	Tangible fixed assets	34,782	36,971	35,638	35,104	29,807
+	Equity in associated companies	4,297	5,084	4,906	6,529	6,817
+	Other non-current assets	2,538	3,884	6,326	2,420	4,462
=	**NON-CURRENT ASSETS (FIXED ASSETS)**	**47,317**	**51,676**	**52,598**	**49,485**	**45,398**
	Inventories	14,734	17,986	20,744	17,296	12,328
+	Trade receivables	7,682	8,888	9,412	8,005	6,872
+	Other operating receivables	1,665	1,931	2,834	2,756	2,281
−	Trade payables	11,633	13,428	13,981	12,614	11,525
−	Other operating payables	4,597	5,197	6,307	5,804	5,596
=	**OPERATING WORKING CAPITAL (1)**	**7,851**	**10,180**	**12,702**	**9,639**	**4,360**
	Non-operating receivables					4,329
−	Non-operating payables	2,087	2,575	5,014	4,993	5,884
=	**NON-OPERATING WORKING CAPITAL (2)**	(2,087)	(2,575)	(5,014)	(4,993)	(1,555)
=	**WORKING CAPITAL (1+2)**	5,764	7,605	7,688	4,646	2,805
	CAPITAL EMPLOYED = NON-CURRENT ASSETS + WORKING CAPITAL	53,081	59,281	60,286	54,131	48,203
=	**SHAREHOLDERS' EQUITY GROUP SHARE**	30,135	38,790	42,086	38,521	38,280
+	Minority interests in consolidated subsidiaries	2,190	2,066	2,022	1,962	1,957
–	Deferred tax assets	5,837	7,055	8,287	8,680	7,866
+	Deferred tax liabilities	2,529	2,684	2,374	2,331	1,832

	in $m	2016	2017	2018	2019	2020
=	**TOTAL GROUP EQUITY**	**29,017**	**36,485**	**38,195**	**34,134**	**34,203**
	Medium- and long-term borrowings and liabilities	11,789	10,143	9,316	10,344	9,000
+	Bank overdrafts and short-term borrowings	6,593	7,809	8,147	7,305	6,307
−	Cash and equivalents, marketable securities	2,615	2,786	2,354	4,995	5,963
+	Pensions liabilities	8,297	7,630	6,982	7,343	4,656
=	**NET DEBT**	**24,064**	**22,796**	**22,091**	**19,997**	**14,000**
	INVESTED CAPITAL = (GROUP EQUITY + NET DEBT) = CAPITAL EMPLOYED	53,081	59,281	60,286	54,131	48,203

Items specific to consolidated accounts are highlighted in blue and will be described in detail in Chapter 6.

Section 4.3 A SOLVENCY-AND-LIQUIDITY ANALYSIS OF THE BALANCE SHEET

The solvency-and-liquidity analysis of the balance sheet, which presents a statement of what is owned and what is owed by the company at the end of the year, can be used:

by shareholders to list everything that the company owns and owes, bearing in mind that these amounts may need to be revalued;

by creditors looking to assess the risk associated with loans granted to the company. In a capitalist system, shareholders' equity is the ultimate guarantee in the event of liquidation since the claims of creditors are met before those of shareholders.

Hence the importance attached to a solvency-and-liquidity analysis of the balance sheet in traditional financial analysis. As we shall see in detail in Chapters 12 and 14, it may be analysed from either a liquidity or a solvency perspective.

1/ BALANCE SHEET LIQUIDITY

A classification of the balance sheet items needs to be carried out prior to the liquidity analysis. Liabilities are classified in the order in which they fall due for repayment. Since balance sheets are published annually, a distinction between the short term and the long term turns on whether a liability is due in less than or more than one year. Accordingly, liabilities are classified into those due in the short term (less than one year), in the medium and long term (more than one year) and those that are not due for repayment.

Likewise, what the company owns can also be classified by duration as follows:

assets that will have disappeared from the balance sheet by the following year, which comprise current assets in the vast majority of cases;

assets that will still appear on the balance sheet the following year, which comprise fixed assets in the vast majority of cases.

From a liquidity perspective, we classify liabilities by their due date, investments by their maturity date and assets as follows:

> Assets are regarded as liquid where, as part of the normal operating cycle, they will be monetised in the same year.

Accordingly, they comprise (unless the operating cycle is unusually long) inventories and trade receivables.

> Assets that, regardless of their nature (head office, plant, etc.), are not intended for sale during the normal course of business are regarded as fixed (non-current) and not liquid.

Balance sheet liquidity therefore derives from the fact that the turnover of assets (i.e. the speed at which they are monetised within the operating cycle) is faster than the turnover of liabilities (i.e. when they fall due). The maturity schedule of liabilities is known in advance because it is defined contractually. However, the liquidity of current assets is unpredictable (risk of sales flops or inventory write-downs, etc.). **Consequently, the clearly defined maturity structure of a company's liabilities contrasts with the unpredictable liquidity of its assets.**

Therefore, short-term creditors will take into account differences between a company's asset liquidity and its liability structure. They will require the company to maintain current assets at a level exceeding that of short-term liabilities to provide a margin of safety. Hence the sacrosanct rule in finance that each and every company must have assets due to be monetised in less than one year at least equal to its liabilities falling due within one year.

2/ SOLVENCY

> Solvency reflects the ability of a company to honour its commitments in the event of liquidation, i.e. if its operations are wound up and are put up for sale.

In accounting terms, a company may be regarded as insolvent once its shareholders' equity turns negative. This means that it owes more than it owns.

Sometimes, the word solvency is used in a broader sense, meaning the ability of a company to repay its debts as they become due (see Chapter 12).

3/ NET ASSET VALUE OR THE BOOK VALUE OF SHAREHOLDERS' EQUITY

This is a solvency-oriented concept that attempts to compute the funds invested by shareholders by valuing the company as the difference between its assets and its liabilities. Net asset value is an accounting and, in some instances, tax-related term, rather than a financial one.

The book value of shareholders' equity is equal to everything a company owns less everything it already owes or may owe. Financiers often talk about net asset value, which leads to confusion among non-specialists, who can construe them as total assets net of depreciation, amortisation and impairment losses.

Book value of equity is thus equal to the sum of:

	Fixed assets
+	Current assets
−	All liabilities and provisions of any kind

When a company is sold, the buyer will be keen to adopt an even stricter approach:

by factoring in contingent liabilities (that do not appear on the balance sheet);

by excluding worthless assets, i.e. of zero value. This very often applies to some intangible assets (see Chapter 7).

SUMMARY

The summary of this chapter can be downloaded from www.vernimmen.com.

The balance sheet shows a snapshot of cumulative inflows and outflows from the company classified into assets and resources (liabilities and shareholders' equity).

Assets comprise fixed assets (intangible and tangible fixed assets and long-term investments) and current assets (inventories, accounts receivable, marketable securities and cash and equivalents). Resources comprise shareholders' equity and bank and financial borrowings, plus trade payables.

A capital-employed analysis of the balance sheet shows all the uses of funds by a company as part of the operating cycle and analyses the origin of the sources of a company's funds at a given point in time.

On the asset side, the capital-employed balance sheet has the following main headings:

fixed assets, i.e. investments made by the company;

operating working capital (inventories and trade receivables minus trade payables). The size of the operating working capital depends on the operating cycle and the accounting methods used to determine earnings;

non-operating working capital, a catch-all category for the rest.

The sum of fixed assets and working capital is called capital employed. Capital employed is financed by capital invested, i.e. shareholders' equity and net debt, and thus this sum is equal to capital employed.

Net debt is defined as bank and financial borrowings, be they short-, medium- or long-term, minus marketable securities (short-term investments) and cash and equivalents.

A solvency-and-liquidity analysis lists everything the company owns and everything that it owes, the balance being the book value of shareholders' equity or net asset value. It can be analysed from either a solvency or liquidity perspective.

Solvency measures the company's ability to honour its commitments in the event of liquidation, whereas liquidity measures its ability to meet its commitments up to a certain date by monetising assets in the ordinary course of business.

QUESTIONS

1/What is another way of describing a difference in “stocks”?

2/What is another way of describing a cumulative inflow or outflow?

3/Does the company operating Singapore Kite Surf Magazine (see Chapter 3) have a positive or negative working capital?

4/Classify the following as “stocks”, in/outflows or change in in/outflows: sales, trade receivables, change in trade receivables, increase in dividends, financial expense, increase in sales, EBITDA.

5/A company's sales clearly represent a source of funds. However, they do not appear on the balance sheet. Why?

6/Classify the following balance sheet items under fixed assets, working capital, shareholders' equity or net debt: overdraft, retained earnings, brands, taxes payable, finished goods inventories, bonds.

7/Is a company that is currently unable to pay its debts always insolvent?

8/Assess the liquidity of the following assets: plant, unlisted securities, listed shares, head office building located in the centre of a large city, ships and aircraft, commercial paper, raw materials inventories, work-in-progress inventories.

9/Give a synonym for net assets.

10/When do we use a capital-employed analysis of the balance sheet? And when do we use a solvency-and-liquidity analysis of the balance sheet?

11/What is the difference between liabilities and sources of funds?

12/Which approach to the balance sheet should you adopt:

when giving a warranty on the balance sheet of a company being sold?

when forecasting a company's working capital?

13/Give examples of businesses with positive working capital.

14/Give examples of businesses with negative working capital.

15/The main manufacturers of telephony equipment (Ericsson, Nokia, etc.) provided telecoms operators (Deutsche Telekom, Swisscom, etc.) with substantial supplier credit lines in order to assist them in financing the construction of their UMTS networks. State your views.

16/Do liabilities that arise during the operating cycle always have a maturity of less than one year?

You'll find more questions at www.vernimmen.com.

EXERCISE

1/Ellingham plc

Draw up the end balance sheet showing capital-employed and invested capital (beginning of year 1, end of year 1, year 2) assuming that the company has equity of €40m.

ANSWERS

Questions

1/*An inflow or outflow.*

2/*A “stock”.*

3/*A negative working capital thanks to subscriptions.*

4/*In order of listing: inflow, “stocks”, inflow, change in outflow, outflow, change in inflow, inflow.*

5/*The balance resulting from the activity is what appears on the balance sheet, i.e. the profit or loss, not the activity itself measured by sales.*

6/*In order of listing: net debt, shareholders' equity, fixed assets, working capital, working capital, net debt.*

7/*In theory, no, as the company may be facing a temporary credit crunch, but most of the time yes because it will have to dispose of assets quickly or stop its activities, which will result in a big reduction in equity, and then it is in insolvency.*

8/*In order of decreasing liquidity: listed securities, commercial paper, raw materials inventories, head office, unlisted securities, ships and aircraft, work-in-progress inventories, plant.*

9/*Shareholders' equity.*

10/*Capital-employed analysis of the balance sheet: for understanding the company's use of funds and how they were financed. Solvency-and-liability analysis of the balance sheet: for listing all assets and liabilities.*

11/*Sources of funds include shareholders' equity (which does not have to be repaid and is consequently not a liability) and liabilities (which sooner or later have to be repaid).*

12/*The solvency-and-liquidity analysis, the capital-employed analysis.*

13/*Most businesses: publishers, appliance manufacturers, chemical industry, etc.*

14/*Movie theatres (no inventories, cash payment from clients), pay TV (subscriptions paid in advance), pastry shop (no inventory over 24 hours, customers pay cash), public works (advance payment from clients).*

15/*These are, in fact, merely financial loans and not operating loans, granted to enable the telecoms operator to buy the equipment made by the manufacturer. These loans should be treated as fixed assets on the manufacturer's balance sheet and as financial debts on the telecom operator's balance sheet.*

16/*No, in some industries, there is a long period between the invoice date and customer payment (e.g. movie rights).*

Exercise

Ellingham plc – see Chapter 5.

BIBLIOGRAPHY

For a thorough explanation of the balance sheet:

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For more advanced topics on balance sheets:

H. Stolowy, M. Lebas, Y. Ding, *Financial Accounting and Reporting: A Global Perspective*, 5th edn, Cengage, 2017.

NOTES

1 *"Non-current assets" in IFRS terminology.*

2 *Known as property, plant and equipment in the US.*

3 *Known as debtors in the UK.*

4 *Required by the European Fourth Directive.*

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Chapter 5
WALKING THROUGH FROM EARNINGS TO CASH FLOW

Or how to move mountains together!

Chapter 2 showed the structure of the cash flow statement, which brings together all the receipts and payments recorded during a given period and determines the change in net debt position.

Chapter 3 covered the structure of the income statement, which summarises all the revenues and charges during a period.

It may appear that these two radically different approaches have nothing in common. But common sense tells us that a rich woman will sooner or later have cash in her pocket, while a poor woman is likely to be strapped for cash – unless she should make her fortune along the way.

Although the complex workings of a business lead to differences between profits and cash, they converge at some point or another.

> The aim of this chapter is to reconcile the cash flow and earnings approaches.

First of all, we will examine revenues and costs from a cash flow standpoint. Based on this analysis, we will establish a link between changes in wealth (earnings) and the change in net debt that bridges the two approaches.

We recommend that readers get to grips with this chapter, because understanding the transition from earnings to the change in net debt represents a key step in comprehending the financial workings of a business.

Section 5.1 ANALYSIS OF EARNINGS FROM A CASH FLOW PERSPECTIVE

This section is included merely for explanatory and conceptual purposes. Even so, it is vital to understand the basic financial workings of a company.

1/ OPERATING REVENUES

Operating receipts should correspond to sales for the same period, but they differ because:

customers may be granted a payment period; and/or

payments of invoices from the previous period may be received during the current period.

As a result, operating receipts are equal to sales only if sales are immediately paid in cash. Otherwise, they generate a change in trade receivables.

	−	Increase in trade receivables		
Sales for the period		or	=	Operating receipts
	+	Reduction in trade receivables		

2/ CHANGES IN INVENTORIES OF FINISHED GOODS AND WORK IN PROGRESS

As we have already seen in by-nature income statements, the difference between production and sales is adjusted for through changes in inventories of finished goods and work in progress.[1] But this is merely an accounting entry, to deduct from operating costs those costs that do not correspond to products sold. It has no impact from a cash standpoint.[2] As a result, changes in inventories need to be reversed in a cash flow analysis.

3/ OPERATING COSTS

Operating costs differ from operating payments in the same way as operating revenues differ from operating receipts. Operating payments are the same as operating costs for a given period only when adjusted for:

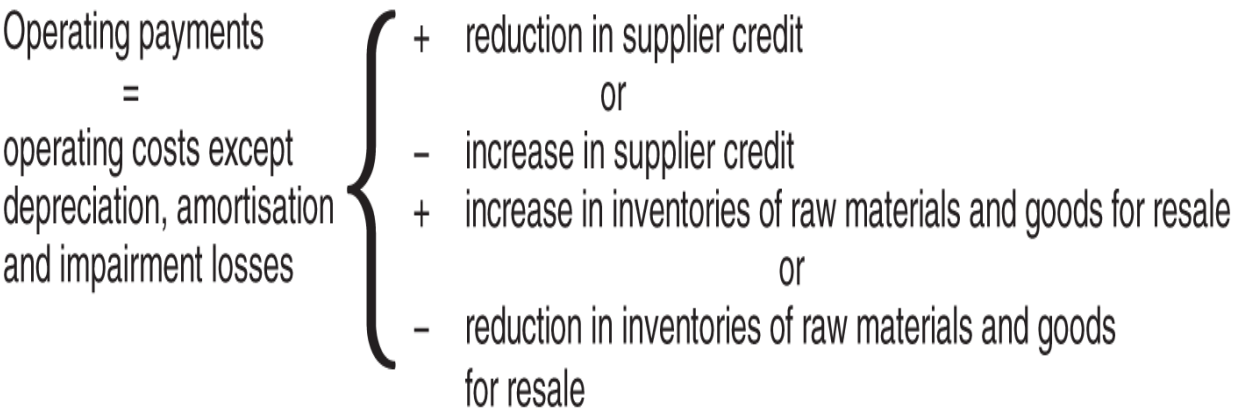
timing differences arising from the company's payment terms (credit granted by its suppliers, etc.);

the fact that some purchases are not used during the same period. The difference between purchases made and purchases used is adjusted for through change in inventories of raw materials.

These timing differences give rise to:

changes in trade payables in the first case;

discrepancies between raw materials used and purchases made, which are equal to change in inventories of raw materials and goods for resale.



The only differences between operating revenues and receipts and between operating charges and payments are timing differences deriving from deferred payments (payment terms) and deferred charges (changes in inventories).

The total amount of the timing differences between operating revenues and costs and between operating receipts and payments can thus be summarised as follows for by-nature and by-function income statements:

BY-NATURE INCOME STATEMENT	DIFFERENCE	CASH FLOW STATEMENT
Net sales	− Change in trade receivables (deferred payment)	= **Operating receipts**
+ **Changes in inventories of finished goods and work in progress**	− Changes in inventories of finished goods and work in progress (deferred charges)	
− **Operating costs except depreciation, amortisation and impairment losses**	− Change in trade payables (deferred payments)	= − **Operating payments**
	− Change in inventories of raw materials and goods for resale (deferred charges)	
=	=	=
= **EBITDA**	− Change in operating working capital	= **Operating cash flows**

BY-FUNCTION INCOME STATEMENT	DIFFERENCE	CASH FLOW STATEMENT
Net sales	− Change in trade receivables (deferred payment) + Change in trade payables (deferred payments)	= **Operating receipts**

BY-FUNCTION INCOME STATEMENT	DIFFERENCE	CASH FLOW STATEMENT
− **Operating costs except depreciation, amortisation and impairment losses**	− Change in inventories of finished goods, work in progress, raw materials and goods for resale (deferred changes)	= − **Operating payments**
= **EBITDA**	− Change in operating working capital	= **Operating cash flows**

Astute readers will have noticed that the items in the central column of the above table are the components of the change in operating working capital between two periods, as defined in Chapter 4.

Over a given period, the change in operating working capital represents a need for, or a source of, financing.

> The change in operating working capital accounts for the difference between EBITDA and operating cash flow.

If positive, it represents a financing requirement and we refer to an increase in operating working capital. If negative, it represents a source of funds and we refer to a reduction in operating working capital.

The change in working capital merely represents a straightforward timing difference between the balance of operating cash flows (operating cash flow) and the wealth created by the operating cycle (EBITDA). As we shall see, it is important to remember that timing differences may not necessarily be small, of limited importance, short or negligible in any way.

> The analysis of changes in working capital is one of the pillars of financial analysis.

4/ CAPITAL EXPENDITURE

Capital expenditures[3] lead to a change in what the company owns without any immediate increase or decrease in its wealth. Consequently, they are not shown directly on the income statement. Conversely, capital expenditures have a direct impact on the cash flow statement.

> From a capital expenditure perspective, there is a fundamental difference separating the income statement and the cash flow statement. The income statement spreads the capital expenditure charge over the entire life of the asset (through depreciation), while the cash flow statement records it only in the period in which it is purchased.

A company's capital expenditure process leads to both cash outflows that do not diminish its wealth at all and the accounting recognition of impairment in the purchased assets through depreciation and amortisation that does not reflect any cash outflows.

Accordingly, there is no direct link between cash flow and net income for the capital expenditure process, as we knew already.

5/ FINANCING

Financing is, by its very nature, a cycle that is specific to inflows and outflows. Sources of financing (new borrowings, capital increases, etc.) do not appear on the income statement, which shows only the remuneration paid on some of these resources, i.e. interest on borrowings but not dividends on equity.

Outflows representing a return on sources of financing may be analysed as either costs (i.e. interest) or a distribution of wealth created by the company among its equity capital providers (i.e. dividends).

> The distinction between capital and interest payments is not of paramount importance in the cash flow statement, but is essential in the income statement.

To keep things simple, assuming that there are no timing differences between the recognition of a cost and the corresponding cash outflow, a distinction needs to be drawn between:

interest payments on debt financing (financial expense) and income tax, which affect the company's cash position and its earnings;

the payments made to equity capital providers (dividends), which affects the company's cash position and earnings transferred to reserves;

new borrowings and repayment of borrowings, capital increases and share buy-backs,[4] which affect its cash position, but have no impact on earnings.

Lastly, corporate income tax represents a charge that appears on the income statement and a cash payment to the state which, though it may not provide any financing to the company, provides it with a range of free services and entitlements, e.g. police, education, roads, etc. Corporate income tax is not always paid as soon as it becomes a cost, thus creating another time lag between a cost and its payment (similar to a variation in working capital).

We can now finish off our table and walk through from earnings to decrease in net debt:

FROM THE INCOME STATEMENT… TO THE CASH FLOW STATEMENT

	INCOME STATEMENT		**DIFFERENCE**			**CASH FLOW STATEMENT**
	EBITDA	−	Change in operating working capital	=	−	**Operating cash flow**
		−	Capital expenditure	=	−	Capital expenditure
		+	Disposals	=	+	Disposals
−	Depreciation, amortisation and impairment losses on fixed assets	+	Depreciation, amortisation and impairment losses on fixed assets (non-cash charges)			
=	**EBIT (operating profit)**			=		**Free cash flow before tax**

	INCOME STATEMENT		DIFFERENCE			CASH FLOW STATEMENT
−	Financial expense net of financial income				−	Financial expense net of financial income
−	Corporate income tax	−		=	−	Corporate income tax
		+	Proceeds from share issues	=	+	Proceeds from share issues
		–	Share buy-backs		–	Share buy-backs
		–	Dividends paid	=	–	Dividends paid
=	**Net income (net earnings)**	+	Column total		=	**Decrease in net debt**

Section 5.2 CASH FLOW STATEMENT

The same table enables us to move in the opposite direction and thus account for the decrease in net debt based on the income statement. To do so, we simply need to add back all the movements shown in the central column to net profit.

	Net income
+	Depreciation, amortisation and impairment losses on fixed assets
–	Change in operating working capital
–	Capital expenditure net of asset disposals
+	Disposals
+	Proceeds from share issue
–	Share buy-backs
–	Dividends paid
=	**Decrease in net debt**

The following reasoning may help our attempt to classify the various line items that enable us to make the transition from net income to decrease in net debt.

Net income should normally turn up in “cash at hand”. That said, we also need to add back certain non-cash costs (depreciation, amortisation and impairment losses on fixed assets) that were deducted on the way down the income statement but have no cash impact, to arrive at what is known as **cash flow**.

Cash flow will appear in “cash at hand” only once the timing differences related to the operating cycle as measured by change in operating working capital have been taken into account.

Lastly, the investing and financing cycles give rise to uses and sources of funds that have no immediate impact on net income.

1/ FROM NET INCOME TO CASH FLOW

As we have just seen, depreciation, amortisation, impairment losses on fixed assets and provisions are non-cash costs that have no impact on a company's cash position. From a cash flow standpoint, they are no different from net income.

Consequently, they are added back to net income to show the total financing generated internally by the company.

These two items form the company's cash flow, which accountants allocate between net income on the one hand and depreciation, amortisation and impairment losses on the other hand, according to the relevant accounting and tax legislation.

Cash flow can therefore be calculated by adding certain non-cash charges net of write-backs to net income.

The simplicity of the cash flow statement shown in Chapter 2 was probably evident to our readers, but it would not fail to shock traditional accountants, who would find it hard to accept that financial expense should be placed on a par with repayments of borrowings. Raising debt to pay financial expense is not the same as replacing one debt with another. The former makes the company poorer, whereas the latter constitutes liability management.

As a result, traditionalists have managed to establish the concept of cash flow. We need to point out that we would advise computing cash flow before any capital gains (or losses) on asset disposals and before non-recurring items, simply because they are non-recurrent items. Cash flow is only relevant in a cash flow statement if it is not made artificially volatile by inclusion of non-recurring items.

Cash flow is not as pure a concept as EBITDA. That said, a direct link may be established between these two concepts by deriving cash flow from the income statement using the top-down method:

	EBITDA
−	Financial expense net of financial income
−	Corporate income tax
=	Cash flow

or the bottom-up method:

	Net income
+	Depreciation, amortisation and impairment losses
+/−	Capital losses/gains on asset disposal*
+/−	Other non-cash items
=	Cash flow

* So as not to take them into account in the computation of cash flow as they are already included in net income.

Cash flow is influenced by the same accounting policies as EBITDA. Likewise, it is not affected by the accounting policies applied to tangible and intangible fixed assets.

Note that the calculation method differs slightly for consolidated accounts,[5] since the contribution to consolidated net profit made by equity-accounted income is replaced by the dividend payment received. This is attributable to the fact that the parent company does not actually receive the earnings of an associate company since it does not control it, but merely receives a dividend.

Furthermore, cash flow is calculated at group level without taking into account minority interests. This seems logical, since the parent company has control of and allocates the cash flows of its fully-consolidated subsidiaries even if they are not fully owned. In the cash flow statement, minority interests in the controlled subsidiaries are reflected only through the dividend payments that they receive.

Lastly, readers should beware of cash flow as there are nearly as many definitions of cash flow as there are companies in the world!

The preceding definition is widely used, but frequently free cash flows, cash flow from operating activities and operating cash flow are simply called “cash flow” by some professionals. So, it is safest to check which cash flow they are talking about.

2/ FROM CASH FLOW TO CASH FLOW FROM OPERATING ACTIVITIES

In Chapter 2 we introduced the concept of cash flow from operating activities, which is not the same as cash flow.

To go from cash flow to cash flow from operating activities, we need to adjust for the timing differences in cash flows linked to the operating cycle.

This gives us the following equation:

> Cash flow from operating activities = Cash flow − Change in operating working capital

Note that the term “operating activities” is used here in a fairly broad sense, since it includes financial expense and corporate income tax.

3/ OTHER MOVEMENTS IN CASH

We have now isolated the movements in cash deriving from the operating cycle, so we can proceed to allocate the other movements to the investment and financing cycles.

The investment cycle includes:

capital expenditures (acquisitions of tangible and intangible assets);

disposals of fixed assets, i.e. the price at which fixed assets are sold and not any capital gains or losses (which do not represent cash flows);

changes in long-term investments (i.e. financial assets).

Where appropriate, we may also factor in the impact of timing differences in cash flows generated by this cycle, notably non-operating working capital (e.g. amount owed to a supplier of a fixed asset).

The financing cycle includes:

capital increases in cash, the payment of dividends (i.e. payment out of the previous year's net profit) and share buy-backs;

change in net debt resulting from the repayment of (short-, medium- and long-term) borrowings, new borrowings, changes in marketable securities (short-term investments) and changes in cash and equivalents.

This brings us back to the cash flow statement in Chapter 2, but using the indirect method, which starts with net income and classifies cash flows by cycle (i.e. operating, investing or financing activities; see next page).

In practice, most companies publish a cash flow statement that starts with net income and moves down to changes in "cash and equivalents" or change in "cash", a poorly defined concept since certain companies include marketable securities while others deduct bank overdrafts and short-term borrowings.

Net debt reflects the level of indebtedness of a company much better than cash and cash equivalents or than cash and cash equivalents minus short-term borrowings, since the latter are only a portion of the debt position of a company. On the one hand, one can infer relevant conclusions from changes in the net debt position of a company. On the other hand, changes in cash and cash equivalents are rarely relevant as it is so easy to increase cash on the balance sheet at the closing date: simply get into long-term debt and put the proceeds in a bank account! Cash on the balance sheet has increased but net debt is still the same.

CASH FLOW STATEMENT FOR ARCELORMITTAL ($M)

		2016	2017	2018	2019	2020
	OPERATING ACTIVITIES					
	Net income	1,734	4,575	5,330	(2,391)	(578)
+	Depreciation, amortisation and impairment losses on fixed assets	2,721	2,768	2,799	2,969	2,894
+	Other non-cash items	50	(1,263)	(3,173)	2,720	(132)
=	**CASH FLOW**	**4,505**	**6,080**	**4,956**	**3,298**	**2,184**
−	Change in working capital	1,000	1,841	83	(3,042)	(1,841)
=	**CASH FLOW FROM OPERATING ACTIVITIES (A)**	**3,505**	**4,239**	**4,873**	**6,340**	**4,025**
	INVESTING ACTIVITIES					
	Capital expenditure	2,444	2,819	3,305	3,772	2,578
−	Disposal of fixed assets	119	22	26	468	237
+	Acquisition of financial assets	–	77	744	838	–
−	Disposal of financial assets	1,182	44	301	318	3,017
=	**CASH FLOW FROM INVESTING ACTIVITIES (B)**	**(1,143)**	**(2,830)**	**(3,722)**	**(3,824)**	**676**
=	**FREE CASH FLOW AFTER FINANCIAL EXPENSE (A – B)**	**2,362**	**1,409**	**1,151**	**2,516**	**4,701**
	FINANCING ACTIVITIES					
	Proceeds from share issues (C)	3,115	–	(226)	(90)	1,477
	Dividends paid (D)	61	141	220	332	181
	A − B + C − D = DECREASE/(INCREASE) IN NET DEBT	**5,416**	**1,268**	**705**	**2,094**	**5,997**
	Decrease in net debt can be broken down as follows:					

		2016	2017	2018	2019	2020
	Repayment of short-, medium- and long-term borrowings	8,429	4,363	3,669	5,110	5,782
−	New short-, medium- and long-term borrowings	1,526	3,266	2,532	5,657	753
+	Change in cash, cash equivalents and marketable securities (short-term investments)	(1,487)	171	(432)	2,641	968
=	**DECREASE/(INCREASE) IN NET DEBT**	**5,416**	**1,268**	**705**	**2,094**	**5,997**

However, it is easy to deduct the change in cash available and cash equivalents from the change in indebtedness:

		2016	2017	2018	2019	2020
	A − B + C − D = DECREASE/(INCREASE) IN NET DEBT	**5,416**	**1,268**	**705**	**2,094**	**5,997**
–	Repayment of short-, medium- and long-term borrowings	8,429	4,363	3,669	5,110	5,782
+	New short-, medium- and long-term borrowings	1,526	3,266	2,532	5,657	753
=	**Change in cash, cash equivalents and marketable securities (short-term investments)**	(1,487)	171	(432)	2,641	968

SUMMARY

The summary of this chapter can be downloaded from www.vernimmen.com.

The first step in the process of moving from the income statement to a cash flow perspective is to recreate operating cash flows. The only differences between operating receipts and operating revenues and between operating costs and operating payments are timing differences related to payment terms (deferred payments) and changes in inventories (deferred charges).

The change in operating working capital accounts for the difference between operating cash flow and the generation of wealth within the operating cycle (EBITDA).

For capital expenditures, there is no direct link between cash flow and net income, since the former records capital expenditures as they are paid and the latter spreads the cost of capital expenditures over their whole useful life.

From a financing standpoint, the cash flow statement does not distinguish between capital and remuneration related to sources of financing, while the income statement shows only returns on debt financing (interest expenses) and corporate income tax.

Net income should normally appear in “cash at hand”, along with certain non-cash charges that together form cash flow. Cash flow may be translated into an inflow or outflow of cash only once adjusted for the change in operating working capital to arrive at cash flow from operating activities in a broad sense of the term.

Lastly, factoring in the investment cycle which gives rise to outflows sometimes offset by fixed asset disposals and the equity financing cycle, we arrive at the decrease in net debt.

QUESTIONS

1/Do inventory valuation methods influence:

the company's net income?

the company's cash position?

2/Are net income and cash position, respectively, influenced by:

depreciation and amortisation

corporate income tax

equity issue through cash contribution

cash purchase of fixed assets

recognition and payment of salaries

disposal for cash of an asset at its book value

sale of goods on credit

payment for these goods

repayment of medium-term loan

financial expenses?

3/What differences are there between cash flow from operating activities and operating cash flow?

4/What non-cash charges must be factored back into calculations of cash flow?

5/Is cash flow a measure of an increase in wealth? Or an increase in cash?

6/Why is the difference between EBITDA and operating cash flows equal to a change in working capital?

7/What difference is there between sales in a financial year and operating receipts over the same period?

8/What is the difference between cash flow and cash flow from operating activities?

9/Why is a decrease in net debt more relevant than a change in cash position or marketable securities?

10/Make use of the cash flow statement to show how impairment losses on current assets have no impact on cash.

11/Will a capital increase by way of incorporation of reserves appear on the cash flow statement?

You'll find more questions at www.vernimmen.com.

EXERCISE

1/Ellingham plc

Draw up a cash flow statement for Ellingham for years 1 and 2. If you so wish, create a cash–earnings link at each level. What is your interpretation of these figures?

ANSWERS

Questions

1/*Yes, the higher inventories are valued, the greater the net income for the current year, and the lower the net income for next year when inventories are sold. And vice versa. No, except for corporate income tax.*

2/*(a) Yes, as depreciation and amortisation are expenses; no, except for corporate income tax, as depreciation and amortisation are non-cash expenses. (b) Yes and yes, as corporate income tax is a cash expense. (c) No, yes, as a source of financing is neither a revenue nor an expense. (d) No, yes, as the cash purchase of a fixed asset is not an expense but a cash payment. (e) Yes, yes, as salaries paid are a cash expense. (f) No, yes, as no capital gain is registered. (g) Yes, no, as a revenue is registered but the cash receipt still has to be received (goods sold on credit). (h) No, yes, as the cash receipt is now received but the revenue has already been registered. (i) No, yes, as repayment of a loan does not modify the wealth of the company but its cash position. (j) Yes, yes, as financial expenses reduce the wealth of the company and its cash position.*

3/*Unlike operating cash flow, cash flow from operating activities encompasses financial expense, tax and some exceptional items as it is computed from net income and these elements are not adjusted.*

4/*Depreciation, amortisation and impairment losses on fixed assets and provisions for liabilities and charges.*

5/*No, cash flow is not a measure of increase in wealth because it does not take into account depreciation, which reflects the wear and tear of fixed assets and thus is a source of wealth destruction. No, because customers do not pay cash, because suppliers are not paid in cash.*

6/*The difference between EBITDA and operating cash flow is nothing but new invoices received or sent but not yet paid either by the company or its customers, or variation in inventories, i.e. increase in working capital.*

7/*Change in trade receivables.*

8/*Changes in working capital.*

9/*Because it is easier to modify the cash position of a company at year end than the net debt position which reflects its true level of indebtedness.*

10/*Impairment losses reduce earnings, but also bring down trade receivables or inventory and therefore working capital: they cancel each other out at the level of the cash flow from operating activities.*

11/*No, it will not impact on the company's cash flow as it is a pure accounting entry.*

Exercise

A detailed Excel version of the solutions is available at www.vernimmen.com.

1/*Ellingham plc*

	Jan	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Y1*	*Y2*	*Y3*
Cash forecast	***Y1***	***Y1***	***Y1***	***Y1***	***Y1***	***Y1***	***Y1***	***Y1***	***Y1***	***Y1***	***Y1***	***Y1***			
Operating inflows															
Sales					*12*	*12*	*12*	*12*	*12*	*12*	*12*	*12*	*96*	*144*	*144*
Operating outflows															
− Purchases				*8*	*12*	*12*	*12*	*12*	*12*	*12*	*12*	*12*	*40*	*48*	*48*
− Personnel costs	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*48*	*48*	*48*
− Shipping		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*22*	*24*	*24*
− Interest expense						*1*						*0.9*	*1.9*	*1.5*	*1.1*
− Capital expenditure	*30*												*30*		
+ New borrowings	*20*												*20*		
− Repayment of borrowings	*2*						*3*						*4*	*4*	*4*
Change in cash	***−16***	***−6***	***−6***	***−14***	***2***	***1***	***0***	***2***	***2***	***2***	***2***	***1.1***	***−29.9***	***18.5***	***18.9***
Cumulated balance	***−16***	***−22***	***−28***	***−42***	***−40***	***−39***	***−39***	***−37***	***−35***	***−33***	***−33***	***−29.9***	***−29.9***	***−11.4***	***7.5***

(N.B. No sales in January year 1 in order to build up initial stock of finished goods.)

Income statement (by nature)	***Year 1***	***Year 2***	***Year 3***
Sales	*132*	*144*	*144*
+ Change in finished goods and in progress in inventory[1]	*10*	*0*	*0*
*= **Production for period***	***142***	***144***	***144***
− Raw material used in the business[2]	*48*	*48*	*48*
− Payroll costs	*48*	*48*	*48*
− Shipping	*24*	*24*	*24*
*= **EBITDA***	***22***	***24***	***24***
− Depreciation and amortisation	*6*	*6*	*6*

Income statement (by nature)	*Year 1*	*Year 2*	*Year 3*
= ***Operating income***	***16***	***18***	***18***
− *Interest expense*	*1.9*	*1.5*	*1.1*
= ***Net earnings***	***14.1***	***16.5***	***16.9***

[1] *Change in finished goods and in-progress inventory: €4m in raw materials + €4m in payroll costs + €2m in shipping costs = €10m.*

[2] *Breakdown of raw materials used in the business in year 1: €52m (purchases) − €4m (increase in raw materials inventories) = €48m.*

Income statement (by function)	*Year 1*	*Year 2*	*Year 3*
Sales	*132*	*144*	*144*
− *Cost of sales*	*116*	*126*	*126*
= ***Operating income***	***16***	***18***	***18***
− *Interest expense*	*1.9*	*1.5*	*1.1*
= ***Net earnings***	***14.1***	***16.5***	***16.9***

Cash flows statement – Format 1	*Year 1*	*Year 2*	*Year 3*
EBITDA	*22*	*24*	*24*
− *Change in working capital*	*36*	*0*	*0*
= ***Operating cash flows***	***−14***	***24***	***24***
− *Capital expenditure*	*30*	*0*	*0*
− *Interest expense*	*1.9*	*1.5*	*1.1*
= ***Net decrease in debt***	***−45.9***	***22.5***	***22.9***
New borrowings	*20*	*0*	*0*
− *Debt repayments*	*4*	*4*	*4*
− *Change in cash and equivalents*	*− 29.9*	*18.5*	*18.9*

Cash flows statement – Format 2	*Year 1*	*Year 2*	*Year 3*
Net income	*14.1*	*16.5*	*16.9*
+ *Depreciation and amortisation*	*6*	*6*	*6*
= ***Cash flow***	***20.1***	***22.5***	***22.9***
− *Change in working capital*	*36*	*0*	*0*
= ***Cash flow from operating activities***	***−15.9***	***22.5***	***22.9***
− *Capital expenditure*	*30*	*0*	*0*
= ***Net decrease in debt***	***−45.9***	***22.5***	***22.9***
New borrowings	*20*	*0*	*0*
− *Debt repayments*	*4*	*4*	*4*
− *Change in cash and equivalents*	*−29.9*	*18.5*	*18.9*

Balance sheet	*Year 1*	*Year 2*	*Year 3*

Balance sheet	*Year 1*	*Year 2*	*Year 3*
Fixed assets, net (A)	***0***	***24***	***18***
Inventories	*0*	*14*	*14*
+ Trade receivables	*0*	*36*	*36*
− Trade payables and other debts	*0*	*14*	*14*
= Working capital (B)	***0***	***36***	***36***
= Capital employed (A + B)	***0***	***60***	***54***
Shareholders' equity (C)	***40***	***54.1***	***70.6***
Bank and financial debts	*0*	*16*	*12*
− Marketable securities	*0*	*0*	*0*
− Cash and equivalents	*40*	*10.1*	*28.6*
= Net debt (D)	*−40*	*5.9*	*−16.6*
= Invested capital (C + D)	***0***	***60***	***54***

The creation of their Greek subsidiary is a clever move. This outfit is profitable the first year, and capital expenditure and increase in working capital (30 + 36) is nearly entirely paid back at end of year 3 after only three years of activity. It is almost too good to be true!

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NOTES

1 *This adjustment is not necessary in by-function income statements, as explained in Chapter 3.*

2 *In accounting parlance, this is known as a "closing entry".*

3 *Or investments in fixed assets.*

4 *When a company buys back some of its shares from some of its shareholders. For more details, see Chapter 37.*

5 *For details on consolidated accounts, see Chapter 6.*

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Chapter 6
GETTING TO GRIPS WITH CONSOLIDATED ACCOUNTS

A group-building exercise

This chapter deals with the basic aspects of consolidation that should be understood by anyone interested in corporate finance.

An analysis of the accounting documents of each individual company belonging to a group does not serve as a very accurate or useful guide to the economic health of the whole group. The accounts of a company reflect the other companies that it controls only through the book value of its shareholdings (revalued or written down, where appropriate) and the size of the dividends that it receives.

> The purpose of consolidated accounts is to present the financial situation of a group of companies as if they formed one single entity.

The goal of this chapter is to familiarise readers with the problems arising from consolidation. Consequently, we present an example-based guide to the main aspects of consolidation in order to facilitate analysis of consolidated accounts.

Section 6.1 CONSOLIDATION METHODS

Any firm that controls other companies exclusively should prepare consolidated accounts and a management report for the group.[1]

Consolidated accounts must be certified by the statutory auditors and, together with the group's management report, made available to shareholders, debtholders and all other parties with a vested interest in the company.

Listed European companies have been required to use IFRS[2] accounting principles for their consolidated financial statements since 2005 and groups from most other countries have been required or allowed to use these accounting standards since then.

The companies to be included in the preparation of consolidated accounts form what is known as the **scope of consolidation**. The scope of consolidation comprises:

the parent company;

the companies in which the parent company has a material influence (which is assumed when the parent company holds at least 20% of the voting rights).

However, a subsidiary should not be consolidated when its parent loses the power to govern its financial and operating policies, for example when the subsidiary becomes subject to the control of a government, a court or an administration. Such subsidiaries should be accounted for at fair market value.

The basic principle behind consolidation consists of replacing the historical cost of the parent's investment in the company being consolidated with its assets, liabilities and equity.

For instance, let us consider a company with a subsidiary that appears on its balance sheet with an amount of 20. Consolidation entails replacing the historical cost of 20 with all or some of the assets, liabilities and equity of the company being consolidated.

There are two methods of consolidation which are used, depending on the strength of the parent company's control or influence over its subsidiary:

Type of relationship	Type of company	Consolidation method
Control	Subsidiary	Full consolidation[3]
Significant influence	Associate	Equity method

We will now examine each of these two methods in terms of its impact on sales, net profit and shareholders' equity.

1/ FULL CONSOLIDATION

The accounts of a subsidiary are fully consolidated if the latter is controlled by its parent. Control is defined as the ability to direct the strategic financing and operating policies of an entity so as to access benefits. It is presumed to exist when the parent company:

holds, directly or indirectly, over 50% of the voting rights in its subsidiary;

holds, directly or indirectly, less than 50% of the voting rights but has power over more than 50% of the voting rights by virtue of an agreement with other investors;

has power to govern the financial and operating policies of the subsidiary under a statute or an agreement;

has power to cast the majority of votes at meetings of the board of directors; or

has power to appoint or remove the majority of the members of the board.

The criterion of exclusive control is the key factor under IFRS standards. It can encompass companies in which only a minority is held (or even no shares at all!) provided the subsidiary is deemed to be controlled by the parent company.

As its name suggests, full consolidation consists of transferring all the subsidiary's assets, liabilities and equity to the parent company's balance sheet and all the revenues and costs to the parent company's income statement.

The assets, liabilities and equity thus replace the investments held by the parent company, which therefore disappear from its balance sheet.

That said, when the subsidiary is not controlled exclusively by the parent company, the claims of the other “minority” shareholders on the subsidiary's equity and net income also need to be shown on the consolidated balance sheet and income statement of the group.

Assuming there is no difference between the book value of the parent's investment in the subsidiary and the share of the book value of the subsidiary's equity,[4] full consolidation works as follows.

On the balance sheet:

- the historical cost amount of the shares in the consolidated subsidiary held by the parent is eliminated from the parent company's balance sheet and the same amount is deducted from the parent company‘s reserves;
- the subsidiary's assets and liabilities are **added item by item** to the parent company's balance sheet;
- the subsidiary's equity (including net income) is then allocated between the interests of the parent company, which is added to its reserves, and those of minority investors in the subsidiary (if the parent company does not hold 100% of the capital), called **minority interests,** which is added on an individualised line of shareholders' equity below the group's share of shareholders' equity.

On the income statement, all the subsidiary's revenues and charges are added item by item to the parent company's income statement. The subsidiary's net income is then broken down into:

- the portion attributable to the parent company, which is added to the parent company's net income to create the line net income attributable to shareholders or group share net income;
- the portion attributable to third-party investors, which is shown on a separate line of the income statement under the heading “minority interests”.

Minority interests represent the share attributable to minority shareholders in the shareholders' equity and net income of fully consolidated subsidiaries.

From a solvency standpoint, minority interests certainly represent shareholders' equity. But from a valuation standpoint, they add no value to the group since minority interests represent shareholders' equity and net profit attributable to third parties and not to shareholders of the parent company.

To illustrate the full consolidation method, consider the following example assuming that the parent company owns 75% of the subsidiary company.

The original non-consolidated balance sheets are as follows:

Parent company's balance sheet			**Subsidiary's balance sheet**				
Investment in the subsidiary[5]	15	Shareholders' equity	70	Assets	28	Shareholders' equity	20
Other assets	57	Liabilities	2			Liabilities	8

In this scenario, the consolidated balance sheet would be as follows:

Consolidated balance sheet			
Investment in the subsidiary (15 − 15)	0	Shareholders' equity (70 –15 + 20)	75
Assets (57 + 28)	85	Liabilities (2 + 8)	10

Or, in an alternative form:

Consolidated balance sheet			
Assets	85	Shareholders' equity group share (75 − 5)	70
		Minority interests (20 × 25%)	5
		Liabilities	10

Group assets and liabilities thus correspond to the sum of the assets and liabilities of the parent company and those of its subsidiary. Group equity is equal to the equity of the parent company increased by the share of the

subsidiary's net income not paid out as dividends since the parent company started consolidating this subsidiary. Minority interests correspond to the share of minority shareholders in the equity and net income of the subsidiary.

The original income statements are as follows:

Parent company's income statement				**Subsidiary's income statement**			
Costs	80	Net sales	100	Costs	30	Net sales	38
Net income	20			Net income	8		

In this scenario, the consolidated income statement would be as follows:

Consolidated income statement			
Costs (80 + 30)	110	Net sales (100 + 38)	138
Net income (20 + 8)	28		

Or, in a more detailed form:

Consolidated income statement			
Costs	110	Net sales	138
Net income:			
Group share	26		
Minority interest (8 × 25%)	2		

Right up until the penultimate line of the income statement, financial analysis assumes that the parent company owns 100% of the subsidiary.

2/ EQUITY METHOD OF ACCOUNTING

When the parent company exercises significant influence over the operating and financial policy of its associate, the latter is accounted for under the equity method. Significant influence over the operating and financial policy of a company is assumed when the parent holds, directly or indirectly, at least 20% of the voting rights. Significant influence may be reflected by participation on the executive and supervisory bodies, participation in strategic decisions, the existence of major intercompany links, exchanges of

management personnel and a relationship of dependence from a technical standpoint.

Most companies that were consolidated under the **proportionate method** are now consolidated under the equity method, since the former method has been banned by IFRS.

Equity accounting consists of replacing the carrying amount of the shares held in an associate (also known as an **equity affiliate** or **associated undertaking**) with the corresponding portion of the associate's shareholders' equity (including net income).

This method is purely financial. Both the group's investments and aggregate profit are thus reassessed on an annual basis. Accordingly, the IASB regards equity accounting as being more of a valuation method than a method of consolidation.

From a technical standpoint, equity accounting takes place as follows:

the historical cost of shares held in the associate is subtracted from the parent company's investments and replaced by the share attributable to the parent company in the associate's shareholders' equity including net income for the year;

the carrying value of the associate's shares is subtracted from the parent company's reserves, to which is added the share in the associate's shareholders' equity, **excluding** the associate's income attributable to the parent company;

the portion of the associate's net income attributable to the parent company is added to its net income on the balance sheet and the income statement.

> Investments in associates, which are included in fixed assets, represent the share attributable to the parent company in associates' shareholders' equity.

The equity method of accounting therefore leads to an increase each year in the carrying amount of the shareholding on the consolidated balance sheet, by an amount equal to its share of the net income transferred to reserves by the associate.

However, from a solvency standpoint, this method does not provide any clue to the group's risk exposure and liabilities (debts, guarantees given, etc.) vis-à-vis its associate. The implication is that the group's risk exposure is restricted to the value of its shareholding.

> The equity method of accounting is more a method used to re-evaluate certain participating interests than a genuine form of consolidation.

To illustrate the equity method of accounting, let us consider the following example based on the assumption that the parent company owns 20% of its associate:

The non-consolidated balance sheets are as follows:

Parent company's balance sheet				**Associate's balance sheet**			
Investment in the associate	5	Shareholders' equity	60	Assets	45	Shareholders' equity	35
Other assets	57	Liabilities	2			Liabilities	10

In this scenario, the consolidated balance sheet would be as follows:

Consolidated balance sheet			
Investment in the associate (5 − 5 + 20% × 35)	7	Shareholders' equity (60 – 5 + 7)	62
Other assets	57	Liabilities	2

The non-consolidated income statements are as follows:

Parent company's income statement				**Associate's income statement**			
Costs	80	Net sales	100	Costs	30	Net sales	35
Net income	20			Net income	5		

In this scenario, the consolidated income statement would be as follows:

Consolidated income statement			
Costs	80	Net sales	100
Net income (20 + 5 × 20%)	21	Minority interest (5 × 20%)	1

Section 6.2 CONSOLIDATION-RELATED ISSUES

1/ SCOPE OF CONSOLIDATION

The scope of consolidation, i.e. the companies to be consolidated, is determined using the rules we presented in Section 6.1. To determine the scope of consolidation, one needs to establish the level of control exercised by the parent company over each of the companies in which it owns shares.

(a) Level of control and ownership level

The **level of control**[6] measures the strength of direct or indirect dependence that exists between the parent company and its subsidiaries, joint ventures or associates. Although control is assessed in a broader way in IFRS (see page 72), the percentage of voting rights that the parent company controls (what we call here “level of control”) will be a key indication to determine whether the subsidiary is controlled or significantly influenced.

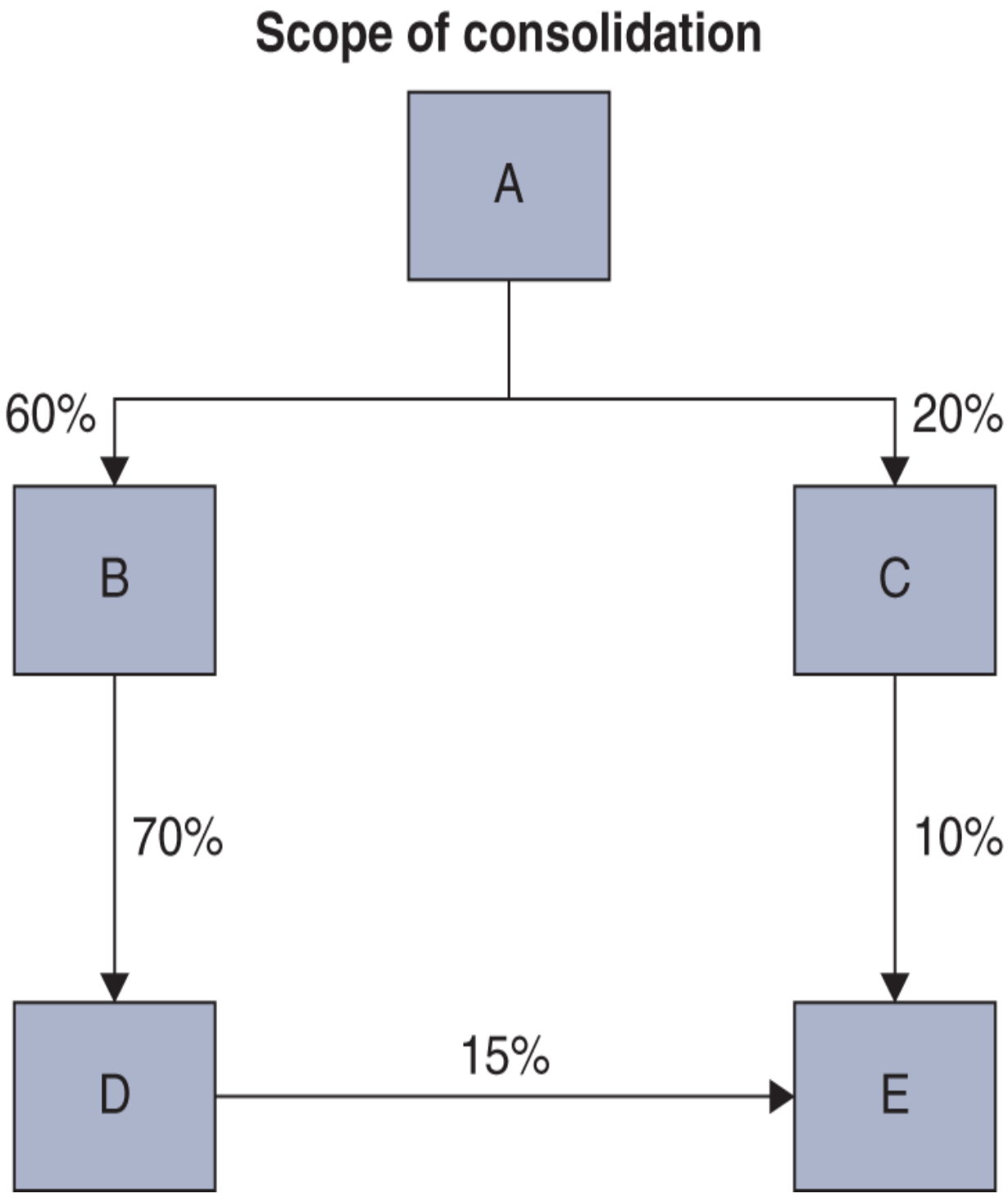
To calculate the level of control, we must look at the percentage of voting rights held by all group companies in the subsidiary provided that the group companies are controlled directly or indirectly by the parent company.

Control is assumed when the percentage of voting rights held is 50% or higher or when a situation of de facto control exists at each link in the chain.

It is important not to confuse the level of control with the level of ownership. Generally speaking, these two concepts are different. The **ownership level**[7] is used to calculate the parent company's claims on its subsidiaries, joint ventures or associates. It reflects the proportion of their capital held directly or indirectly by the parent company. It is a financial concept, unlike the level of control, which is a power-related concept.

The ownership level is the sum of the product of the direct and indirect percentage stakes held by the parent company in a given company. The ownership level differs from the level of control, which considers only the controlled subsidiaries.

Consider the following example:



A controls 60% of B, B controls 70% of D, so A *controls* 70% of D. D and B are therefore considered as controlled and thus fully consolidated by A. But A does not *own* 70%, but 42% of D (i.e. 60% × 70%). The ownership level of A over D is then 42%: only 42% of D's net income is attributable to A.

Since C owns just 10% of E, C will not consolidate E. Neither will D as it only owns 15% of E. But since A controls 20% of C, A will account for C under the equity method and will show 20% of C's net income in its income statement.

The ownership level of A over E is 20% × 10% + 60% × 70% × 15% = 8.3%. The percentage of control of A over E is 15%.

How the ownership level is used varies from one consolidation method to another:

with full consolidation, the **ownership level** is used only to allocate the subsidiary's reserves and net income between the parent company and minority interests in the subsidiary;

with the equity method of accounting, the **ownership level** is used to determine the portion of the subsidiary's shareholders' equity and net income attributable to the parent company.

(b) Changes in the scope of consolidation

It is important to analyse the scope of consolidation, especially with regard to what has changed and what is excluded. Indeed, a decision not to consolidate a company means concealing its losses, its shareholders' equity as well as the amount of its liabilities.

Using the equity method for consolidating a subsidiary, which should in fact be fully consolidated, allows one to avoid showing its debts in the group's consolidated balance sheet.

Certain techniques can be used to remove subsidiaries still controlled by the parent company from the scope of consolidation. These techniques have been developed to make certain consolidated accounts look more attractive. These techniques frequently involve a special-purpose vehicle (SPV). The SPV is a separate legal entity created specially to handle a venture on behalf of a company. In many cases, from a legal standpoint the SPV belongs to banks or to investors rather than to the company. That said, the company must consolidate the SPV if it controls it, even without owning a single of its shares, as explained in the first paragraph of Section 6.1. These rules make it very difficult to use this type of scheme under IFRS or US GAAP.

Changes in the scope of consolidation require the preparation of **pro forma** financial statements. Pro forma statements enable analysts to compare the company's performances on a consistent basis. In these pro forma statements, the company restate past accounts to make them comparable with the current scope of consolidation.

2/ GOODWILL

It is very unusual for one company to acquire another for exactly its book value.

Generally speaking, there is a difference between the acquisition price, which may be paid in cash or in shares, and the portion of the target company's shareholders' equity attributable to the parent company. In most cases, this difference is positive as the price paid exceeds the target's book value.

(a) What does this difference represent?

In other words, why should a company agree to pay out more for another company than its book value? There are several possible explanations:

the assets recorded on the acquired company's balance sheet are worth more than their carrying cost. This situation may result from the prudence principle, which means that unrealised capital losses have to be taken into account, but not unrealised capital gains;

it is perfectly conceivable that assets such as patents, licences and market shares that the company has accumulated over the years without wishing to, or even being able to, account for them, may not appear on the balance sheet. This situation is especially true if the company is highly profitable;

the merger between the two companies may create synergies, either in the form of cost reductions and/or revenue enhancement. The buyer is likely to partly reflect them in the price offered to the seller;

the buyer may be ready to pay a high price for a target just to prevent a new player from buying it, entering the market and putting the current level of the buyer's profitability under pressure;

finally, the buyer may quite simply have overpaid for the deal.

(b) How is goodwill accounted for?

When first consolidated, the assets of the new subsidiary or joint venture are valued at their fair value and are recorded on the group's balance sheet in these amounts. Intangible assets of the acquired company in particular are valued, even if they aren't recognised on its balance sheet: brands concerned, patents, software, emissions permits or landing rights, customer lists, etc. Accordingly, the equity capital of the newly consolidated company will be revalued.

The difference between the price paid by the parent company for its shares in the acquired company and the parent company's share in the revalued equity of the acquired company is called goodwill. It appears on the asset side of the new group's balance sheet as intangible assets.

For associates recently accounted for under the equity method of accounting, goodwill is calculated extra-accountably since their assets and liabilities are not included in the consolidated balance sheet. They are then added to other goodwill.

> This method is known as the purchase method and it gives rise to the purchase price allocation between the assets and liabilities due from the acquired company (PPA for friends and family).

Under IFRS and US GAAP, goodwill is assessed each year to verify whether its value is at least equal to its net book value as shown on the group's balance sheet. This assessment is called an impairment test. If the market value of goodwill is below its book value, then goodwill is written down to its fair market value and a corresponding impairment loss is recorded in the income statement.[8] This impairment loss cannot be reversed in the future.

To illustrate the purchase method, let's analyse now how LVMH accounted for the acquisition of the luxury hotels group, Belmond, in 2019.

Prior to the acquisition, LVMH's balance sheet (in billions of EUR) can be summarised as follows:

Intangible assets	31.0	Shareholders' equity	34.0

Other fixed assets	17.8	Net debt	18.9
Working capital	7.2	Deferred tax	3.1

While Belmond's balance sheet (in billions of EUR) was as follows:

Intangible assets	0	Shareholders' equity	0.3
Other fixed assets	1.1	Provisions	0.6
Working capital	−0.1	Net debt	0.1

LVMH acquired 100% of Belmond for €2.3bn paid for in cash. Therefore, LVMH paid €2bn[9] more than Belmond equity. This amount is not equal to goodwill, as LVMH proceeded to a revaluation of assets and liabilities of Belmond as follows:

intangible assets	+€0.1bn
other fixed assets	+€1.2bn
working capital	+€0.1bn
deferred tax liability[10]	+€0.4bn
net debt (fair value)	+€0.0bn

Total adjustments amount to €1.0bn (–0.1 + 1.2 + 0.1 – 0.4 – 0.3). Consequently, the amount of goodwill created was €2.0bn – €1.0bn = €1.0bn. The simplified balance sheet of the combined entity was therefore as follows:

Intangible assets	31.0 + 0 + 0.1 = 31.1	Shareholders' equity	34.0
Goodwill	1.1	Net debt	18.9 + 0.6 + 0.0 + 2.3 = 21.8
Other fixed assets	17.8 + 1.1 + 1.2 = 20.1	Deferred tax	3.1 + 0.1 + 0.4 = 3.6
Working capital	7.2 – 0.1 + 0.1 = 7.2		

Finally, transactions may give rise to negative goodwill under certain circumstances. Under IFRS, negative goodwill is immediately recognised as a profit in the income statement of the new group.

(c) How should financial analysts treat goodwill?

From a financial standpoint, it is sensible to regard goodwill as an asset like any other, which may suffer sudden falls in value that need to be recognised by means of an impairment charge. We advise our readers to treat impairment charges as non-recurring items and to exclude them for the computation of returns (see Chapter 13) or earnings per share (see Chapter 22).

> Testing each year whether the capital employed of each company segment is greater than its book value so as to determine whether the purchased goodwill needs to be written down is implicitly checking whether internally generated goodwill gradually replaces the purchased goodwill or not. As we know, goodwill has a limited lifespan in view of the competition prevailing in the business world that will, sooner or later, erode too high a profitability obtained after an acquisition.

Can it be argued that goodwill impairment losses do not reflect any decrease in the company's wealth because there is no outflow of cash? We do not think so.

Granted, goodwill impairment losses are a non-cash item, but it would be wrong to say that only decisions giving rise to cash flows affect a company's value. For instance, setting a maximum limit on voting rights or attributing 10 voting rights to certain categories of shares does not have any cash impact, but definitely reduces the value of the excluded shares.

Recognising the impairment of goodwill related to a past acquisition is tantamount to admitting that the price paid was too high. But what if the acquisition was paid for in shares? This makes no difference whatsoever, irrespective of whether the buyer's shares were overvalued at the same time.

Had the company carried out a share issue rather than overpaying for an acquisition, it would have been able to capitalise on its lofty share price to the great benefit of existing shareholders. The cash raised through the share

issue would have been used to make acquisitions at much more reasonable prices once the wave of euphoria had subsided.

It is essential to remember that shareholders in a company which pays for a deal in shares suffer dilution in their interest. They accept this dilution because they take the view that the size of the cake will grow at a faster rate (e.g. by 30%) than the number of guests invited to the party (e.g. by over 25%). Should it transpire that the cake grows at merely 10% rather than the expected 30% because the purchased assets prove to be worth less than anticipated, then the number of guests at the party will unfortunately stay the same. Accordingly, the size of each guest's slice of the cake falls by 12% (110 / 125 − 1), so shareholders' wealth has certainly diminished.

(d) How should financial analysts treat “adjusted income”?

Some groups (particularly in the pharmaceutical sector) like Pfizer or Sanofi, following an acquisition, publish an “adjusted income” to neutralise the P&L impact of the revaluation of assets and liabilities of its newly acquired subsidiary. Naturally, a P&L account is drawn up under normal standards, but it carries an audited table showing the impact of the switch to adjusted income on operating income and net income.

As a matter of fact, by virtue of the revaluation of the target's inventories to their market value, the normal process of selling the inventories generates no profit. So how relevant will the P&L be in the first year after the merger? This issue becomes critical only when the production cycle is very long and therefore the revaluation of inventories (and potentially research and development capitalised) is material.

We believe that for those specific cases, groups are right to show this adjusted P&L.

Section 6.3 TECHNICAL ASPECTS OF CONSOLIDATION

1/ HARMONISING ACCOUNTING DATA

Since consolidation consists of aggregating accounts, give or take some adjustments, it is important to ensure that the accounting data used are consistent, i.e. based on the same principles.

Usually, the valuation methods used in individual company accounts are determined by accounting or tax issues specific to each subsidiary, especially when some of them are located outside the group's home country. This is particularly true for provisions, depreciation and amortisation, fixed assets, inventories and work in progress, deferred charges and shareholders' equity.

These differences need to be eliminated upon consolidation. This process is facilitated by the fact that most of the time consolidated accounts are not prepared to calculate taxable income, so groups may disregard the prevailing tax regulations.

Prior to consolidation, the consolidating company needs to restate the accounts of the to-be-consolidated companies. The consolidating company applies the same valuation principles and makes adjustments for the impact of the valuation differences that are justified on tax grounds, e.g. tax-regulated provisions, accelerated depreciation for tax purposes and so on.

2/ ELIMINATING INTRA-GROUP TRANSACTIONS

Contrary to the simplified vision we presented in Section 6.1, consolidation entails more than the mere aggregation of accounts. Before the consolidation process as such can begin, intra-group transactions and their impact on net income have to be eliminated from the accounts of both the parent company and its consolidated companies.

Assume, for instance, that the parent company has sold to subsidiaries products at cost plus a margin. An entirely fictitious gain would show up in the group's accounts if the relevant products were merely held in stock by the subsidiaries rather than being sold on to third parties. Naturally, this

fictitious gain, which would be a distortion of reality, needs to be eliminated.

Intra-group transactions to be eliminated upon consolidation can be broken down into two categories:

Those that are very significant because they affect consolidated net income. It is therefore vital for such transactions to be reversed. The goal is to avoid showing the same profit twice in two different years. The reversal of these transactions upon consolidation leads primarily to the elimination of:

- intra-group profits included in inventories;
- capital gains arising on the transfer or contribution of investments;
- dividends received from consolidated companies;
- impairment losses on intra-group loans or investments; and
- tax on intra-group profits.

Those that are not fundamental because they have no impact on consolidated net income or those affecting the assets or liabilities of the consolidated entities. These transactions are eliminated through netting, so as to show the real level of the group's debt. They include:

- parent-to-subsidiary loans (advances to the subsidiary) and vice versa;
- interest paid by the parent company to the consolidated companies (financial income of the latter) and vice versa.

3/ TRANSLATING THE ACCOUNTS OF FOREIGN SUBSIDIARIES

(a) The problem

The translation of the accounts of foreign companies is a tricky issue because of exchange rate fluctuations and the difference between inflation rates, which may distort the picture provided by company accounts.

For instance, a parent company located in the Eurozone may own a subsidiary in a country with a soft currency.[11]

Using year-end exchange rates to convert the assets of its subsidiary into the parent company's currency understates their value. From an economic standpoint, all the assets do not suffer depreciation proportional to that of the subsidiary's home currency.

On the one hand, fixed assets are protected to some extent. Inflation means that it would cost more in the subsidiary's local currency to replace them after the devaluation in the currency than before. All in all, the inflation and devaluation phenomena may actually offset each other, so the value of the subsidiary's fixed assets in the parent company's currency is roughly stable. On the other hand, inventories (usually), receivables and liabilities (irrespective of their maturity) denominated in the devalued currency all depreciate in tandem with the currency.

If the subsidiary is located in a country with a hard currency (i.e. a stronger one than that of the parent company), then the situation is similar but the implications are reversed.

To present an accurate image of developments in the foreign subsidiary's situation, it is necessary to take into account:

the impact on the consolidated accounts of the translation of the subsidiary's currency into the parent company's currency;

the adjustment that would stem from translation of the foreign subsidiary's fixed assets into the local currency.

(b) Methods

Several methods may be used at the same time to translate different items in the balance sheet and income statement of foreign subsidiaries, giving rise to currency translation differences.

The most frequently used method is called the **closing rate method**: all assets and liabilities are translated at the closing rate, which is the rate of exchange at the balance sheet date.[12] Revenues and charges on the income statement are translated at the average rate over the fiscal year.[13] Currency translation differences are recorded under shareholders' equity, with a distinction being made between the group's share and that attributable to minority investors. This translation method is used under IFRS and it is relatively comparable to the US standard.

The **temporal method** consists of translating:

monetary items (i.e. cash and sums receivable or payable denominated in the foreign company's currency and determined in advance) at the closing rate;

non-monetary items (fixed assets and the corresponding depreciation and amortisation,[14] inventories, prepayments, shareholders' equity, investments, etc.) at the exchange rate at the date to which the historical cost or valuation pertains (i.e. the exchange rate on the day on which the asset or liability was acquired or contracted);

revenues and charges on the income statement theoretically at the exchange rate prevailing on the transaction date. In practice, however, they are usually translated at an average exchange rate for the period.

Under the temporal method, the difference between the net income on the balance sheet and that on the income statement is recorded on the income statement under foreign exchange gains and losses.

(c) Translating the accounts of subsidiaries located in hyperinflationary countries

A hyperinflationary country is one where inflation is both chronic and out of control. In such circumstances, the previous methods are not suitable for translating the effects of inflation into the accounts.

Hence the use of a specific method based on restatements made by applying a general price index. Elements such as monetary items that are already stated at the measuring unit at the balance sheet date are not restated. Other elements are restated based on the change in the general price index between the date those items were acquired or incurred and the balance sheet consolidation. A gain or loss on the net monetary position is included in net income. IFRS prescribes this method, which is not allowed in the US where the temporal method is applied.

SUMMARY

The summary of this chapter can be downloaded from www.vernimmen.com.

Consolidation aims at presenting the financial position of a group of companies as if they formed one single entity. It is an obligation for companies that exclusively control other companies or exercise significant influence over them. The scope of consolidation encompasses the parent company and the companies that the parent company controls, or over which it exercises significant influence.

Full consolidation, which is applied when the parent company controls its subsidiary, consists of replacing the investments on the parent company's balance sheet with all the subsidiary's assets, liabilities and equity, as well as adding all the revenues and charges from its income statement. This method gives rise to minority interests in the subsidiary's net income and shareholders' equity if it is not wholly owned by the parent company.

Where the parent company exercises significant influence (usually by holding over 20% of the voting rights) over another company (hence called an associate), the equity method of accounting is used. The book value of investments is replaced by the parent company's share in the associate's equity (including net income). This method is actually equivalent to an annual revaluation of these investments. The portion of the associate's net income attributable to the parent company is added to its net income on the income statement under the line “Income from associates”.

From a financial standpoint, the ownership level, which represents the percentage of the capital held directly or indirectly by the parent company, is not equal to the level of control, which reflects the proportion of voting rights held. The level of control is used to determine which consolidation method is applied. The ownership level is used to separate the group's interests from minorities' interests in equity and net income.

A group often acquires a company by paying more than the book value of the company's equity. The difference is recorded as goodwill under intangible assets, minus any unrealised capital gains or losses on the

acquired company's assets and liabilities. This goodwill arising on consolidation is compared each year with its estimated value and written down to fair market value, where appropriate.

When analysing a group, it is essential to ensure that the basic accounting data are consistent from one company to another. Likewise, intra-group transactions, especially those affecting consolidated net income (intra-group profits, dividends received from subsidiaries, etc.), must be eliminated upon consolidation.

Two methods are used to translate the accounts of foreign subsidiaries: the closing rate and the temporal method for currency exchange rate translations. In addition, specific currency translation methods are used for companies in hyperinflationary countries.

QUESTIONS

1/Describe the two main methods used for consolidating accounts.

2/What criticism can be made of the equity method of accounting?

3/What is the difference between the proportion of voting rights held and the ownership level?

4/Give an example where the proportion of voting rights held and the ownership level are the same.

5/On the consolidated income statement, what is the “share of earnings in companies accounted for under the equity method” similar to?

6/In what circumstances should the group's share be separated from that attributable to minority investors?

7/Will opening up the capital of a subsidiary to shareholders outside the group through a capital increase have an impact on the group's earnings? Is this a paradox? Explain.

8/Why do dividends paid by subsidiaries have to be restated when consolidated accounts are drawn up?

9/What is goodwill and how is it stated?

10/What is the most frequently used method of consolidation? Why?

11/Why have some groups judged it necessary to publish adjusted income?

12/A buys 100% of company B paid in cash. Is the consolidated equity of A + B the sum of the equity of A and B?

You'll find more questions at www.vernimmen.com.

EXERCISE

1/The financial statements of company *M* and its subsidiary *S* are shown here (in €m).

Balance sheet:

Assets	**M**	**S**	**Equity and liabilities**	**M**	**S**
Tangible and intangible fixed assets	100	30	Equity and share capital	40	10
Investment in subsidiary *S*	16	—	Reserves	80	10
Other investments	5	—	Net earnings	10	5
Current assets	200	70	Debt	191	75
Total	**321**	**100**	**Total**	**321**	**100**

Income statement

	M	**S**
Sales	200	90
− Purchases of raw materials	100	50
− Change in inventories	—	2
− Other external services	25	20
− Personnel costs	40	8
Interest and other financial charges	10	1
+ Interest, dividends and other financial income	3	—
Exceptional costs	9	—
+ Exceptional income	2	—
Corporate income tax	11	4
= **Net income**	**10**	**5**

Draw up the consolidated accounts for the group *M* + *S* in the following circumstances:

M has an 80% stake in *S* (full consolidation).

M has a 20% stake in *S* (equity method consolidation).

(NB. It is assumed that there are no flows between *M* and *S*.)

ANSWERS

Questions

1/*See chapter.*

2/*It is not really a consolidation method but a method for revaluing assets.*

3/*See chapter.*

4/*A owns its stake in B directly or through a 100% subsidiary.*

5/*Financial income on long-term investments.*

6/*When valuing shares of the group because shareholders of the group have no claim whatsoever on stakes owned by minority interests in subsidiaries.*

7/*Yes, it results in minority interests. This is a paradox since the group registers a profit or a loss without receiving cash. This is because of the increase or reduction in the group's share in shareholders' equity (see Section 7.7).*

8/*Because they are internal flows.*

9/*Goodwill is the difference between the price paid for the subsidiary and the estimated value of its assets minus liabilities. Goodwill is an intangible asset, the value of which will be tested every year and impaired if need be.*

10/*Full consolidation because groups tend to prefer exclusive control over joint control or significant influence.*

11/*To provide more accurate financial information in some specific cases.*

12/*No, because A has not issued equity to acquire B. See the Belmond example in Section 6.2.*

Exercise

A detailed Excel version of the solutions is available at www.vernimmen.com.

***M* + *S* balance sheet (€m)**	**80%**	**20%**
Assets		
Tangible and intangible fixed assets	130	100
Equity in associated companies		5
Current assets	270	200
Investments	5	5
Total	**405**	**310**
Equity and liabilities		
Share capital	40	40
Reserves	80*	68
Minority interests in equity	4	
Net earnings (group share)	14	11
Minority interests in net earnings	1	
Debt	266	191
Total	**405**	**310**

*Group share.

***M* + *S* income statement (€m)**	**80%**	**20%**
Sales	290	200
Purchase of raw materials	150	100
Change in inventories	2	
Other external services	45	25
Personnel costs	48	40
Interest and other finance charges	11	10
+ Interest, dividends and other financial income	3	3
Exceptional costs	9	9

***M* + *S* income statement (€m)**	**80%**	**20%**
+ Exceptional income	2	2
Corporate income tax	15	11
+ Income from associates		1
= Net earnings	15	11
Minority interests	1	
= Net earnings, group share	14	

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NOTES

1 *Unless (i) the parent is itself a wholly owned subsidiary or is virtually wholly owned and (ii) its securities are not listed or about to be and (iii) the immediate or ultimate parent issues consolidated accounts*.

2 *IFRS rules are produced by the International Accounting Standards Board (IASB), a private organisation made up mainly of accountants from various parts of the world*.

3 *Or simply consolidation.*

4 *Which means "no goodwill", a topic to which we will return in Section 6.2.*

5 *Valued at historical cost less depreciation if any.*

6 *Or percentage control.*

7 *Or percentage interest.*

8 *Unlisted US companies are allowed to systematically depreciate goodwill over a period of up to 10 years.*

9 *2.3bn − 0.3bn = 2bn.*

10 *See Chapter 7.*

11 *A soft or weak currency is a currency that tends to fall in value because of political or economic uncertainty (high inflation rate).*

12 *This method is also called the current rate method.*

13 *IFRS recommend using the exchange rate prevailing on the transaction date to translate revenues and charges but this is rarely done for practical reasons, except when large fluctuations in exchange rates were registered.*

14 *As an exception to this rule, goodwill is translated at the closing rate.*

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Chapter 7
HOW TO COPE WITH THE MOST COMPLEX POINTS IN FINANCIAL ACCOUNTS

Everything you always wanted to know but never dared to ask!

This chapter is rather different from the others. It is not intended to be read from start to finish, but consulted from time to time, whenever readers experience problems interpreting, analysing or processing a particular accounting item.

Each of these complex points will be analysed from these angles:

from an economic standpoint so that readers gain a thorough understanding of its real substance;

from an accounting standpoint to help readers understand the accounting treatment applied and how this treatment affects the published accounts;

from a financial standpoint to draw a conclusion as to how best to deal with this problem.

Our experience tells us that this is the best way of getting to grips with and solving problems. The key point to understand in this chapter is the method we use to deal with complex issues, since we cannot look at every single point here. When faced with a different problem, readers will have to come up with their own solutions using our methodology – unless they contact us through the vernimmen.com website.

The following bullet list shows, in alphabetical order, the main line items and principal problems that readers are likely to face:

accruals	inventories
cash assets	leases
construction contracts	off-balance sheet commitments
convertible bonds or loans	pensions and other employee benefits

currency translation adjustments	preference shares
deferred tax assets and liabilities	provisions
dilution profits or losses	stock options
financial hedging instruments	tangible fixed assets
impairment losses	treasury shares.
intangible fixed assets	

Section 7.1 ACCRUALS

1/ WHAT ARE ACCRUALS?

Accruals are used to recognise revenue and costs booked in one period but relating to another period. “To accrue” basically means to transfer revenue or costs from the P&L to the balance sheet.

2/ HOW ARE THEY ACCOUNTED FOR?

The main categories of accruals are:

prepaid costs, i.e. costs relating to goods or services to be supplied later. For instance, three-quarters of a rental charge payable in advance for a 12-month period on 1 October each year will be recorded under prepaid costs on the asset side of the balance sheet at 31 December;[1]

deferred income, i.e. income accounted for before the corresponding goods or services have been delivered or carried out. For instance, a monthly magazine records three-quarters of the annual subscription payments it receives on 1 October under deferred income on the liabilities side of its balance sheet at 31 December.

We should also mention accrued income and cost, which work in the same way as deferred income and prepaid cost, only in reverse. For example, a company can accrue R&D costs, i.e. consider that it should not appear in the P&L but as an intangible asset that will be amortised or depreciated.

3/ HOW SHOULD FINANCIAL ANALYSTS TREAT THEM?

Deferred income and prepaid cost form part of operating working capital.

Section 7.2 CASH ASSETS

1/ WHAT ARE CASH ASSETS?

Cash assets correspond to short-term investment of a company's cash surpluses (see Chapter 50).

2/ HOW ARE THEY ACCOUNTED FOR?

From an accounting point of view, such investments can only be considered as cash equivalent if they are very liquid, short term, easily converted into cash for a known amount and exposed to a negligible risk of change in value.

In practice, a certain number of criteria are applied (especially for UCITS): benchmark index, frequency of liquidity value, penalties in the event of exit, volatility, counterparty risk, etc.

Under IFRS, cash assets are valued on the basis of their fair value, with any gains and losses recognised in the income statement as financial income.

3/ HOW SHOULD FINANCIAL ANALYSTS TREAT THEM?

In a period of negative short-term interest rates, such as in the Eurozone, Switzerland and Japan since 2015, it is advisable to be particularly vigilant about cash assets generating zero or positive returns, which cannot fail to involve risk taking.

The classification of cash assets or long-term investment assets is important when evaluating the liquidity of a company. From an economic point of view, the analyst will try to understand, first and foremost, whether the asset contributes to operating earnings (and should thus be integrated into capital employed), or if it is a financial investment (whether long or short term). It will then be deducted from net debt.

Section 7.3 CONSTRUCTION CONTRACTS

1/ WHAT ARE CONSTRUCTION CONTRACTS?

In some cases, it may take more than a year for a company to complete a project. For instance, a group that builds dams or ships may work for several years on a single project.

2/ HOW ARE THEY ACCOUNTED FOR?

Construction contracts are accounted for using the percentage of completion method, which consists of recognising at the end of each financial year the sales and profit/loss anticipated on the project in proportion to the percentage of the work completed at that time. US accounting rules recognise both the percentage of completion method and the completed contract method, where revenue recognition is deferred until completion of the contract.[2]

3/ HOW SHOULD FINANCIAL ANALYSTS TREAT THEM?

Construction projects in progress are part of the operating working capital. The percentage of completion method results in less volatile profits as they are spread over several fiscal years, even if the completed contract method may seem more prudent. Analysts should be aware of changes in accounting methods for construction contracts (which are not possible under IFRS) as such changes may indicate an attempt to artificially improve the published net income for a given year.

Section 7.4 CONVERTIBLE BONDS AND LOANS

1/ WHAT ARE CONVERTIBLE BONDS AND LOANS?

Convertible bonds are bonds that may be converted at the request of their holders into shares in the issuing company. Conversion is thus initiated by the investor.[3] If they are not converted, they are repaid in cash at maturity.

2/ HOW ARE THEY ACCOUNTED FOR?

When they are issued, convertible bonds and loans are allocated between debt and equity accounts[4] since they are analysed under IFRS standards as compound financial instruments made up of a straight bond and a call option (see Chapter 24). The present value of the coupons and reimbursement amount discounted at a fair borrowing rate of the firm is accounted for as debt. The remainder is accounted for as equity. In addition, each year the company will account for the interest as it would be paid for a standard bond (part of this amount corresponding to the actual amount paid, the rest being a notional amount).

3/ HOW SHOULD FINANCIAL ANALYSTS TREAT THEM?

The approach we recommend is to examine the conditions governing conversion of the bonds and to make the equity/debt classification based on the results of this analysis. For instance, if the share price already lies well above the conversion price, then the bonds are very likely indeed to be converted, so they should be treated as equity. For valuation purposes, the related interest expense net of tax should be reversed out of the income statement, leading to an increase in net income. The number of shares should also be increased by those to be issued through the conversion of the convertible bonds.

On the other hand, if the share price is below the conversion price, then convertible bonds should be treated as conventional bonds and stay classified as borrowings.

Section 7.5 CURRENCY TRANSLATION ADJUSTMENTS

See Chapter 6.

Section 7.6 DEFERRED TAX ASSETS AND LIABILITIES

1/ WHAT ARE DEFERRED TAX ASSETS AND LIABILITIES?

Deferred taxation giving rise to deferred tax assets or liabilities stems from differences between the taxable and book values of assets and liabilities.

On the income statement, certain revenues and charges are recognised in different periods for the purpose of calculating pre-tax accounting profit and taxable profit.

In some cases, the difference may be temporary due to the method used to derive taxable profit from pre-tax accounting profit. For instance, a cost has been recognised in the accounts, but is not yet deductible for tax purposes (e.g. employee profit-sharing in some countries), or vice versa. The same may apply to certain types of revenue. Such differences are known as **timing differences**.

In other circumstances, the differences may be definitive, i.e. for revenue or charges that will never be taken into account in the computation of taxable profit (e.g. tax penalties or fines that are not deductible for tax purposes). Consequently, there is no deferred tax recognition.

On the balance sheet, the historical cost of an asset or liability may not be the same as its tax base, which creates a **temporary difference**. Depending on the situation, temporary differences may give rise to a future tax charge and thus deferred tax liabilities, while others may lead to future tax deductions and thus deferred tax assets. For instance, deferred tax liabilities may arise from:

assets with a tax base that is lower than their book value when sold or used. The most common example of this derives from the revaluation of assets upon the first-time consolidation of a subsidiary. Their value on the consolidated balance sheet is generally higher than their tax base used to calculate tax-deductible depreciation and amortisation or capital gains and losses;

capitalised costs that are deductible immediately for tax purposes, but that are accounted for on the income statement over several years or deferred;

revenues, the taxation of which is deferred, such as accrued financial income that becomes taxable only once it has been actually received.

Deferred tax assets may arise in various situations including costs that are expensed in the accounts but are deductible for tax purposes in later years only, such as:

provisions that are deductible only when the stated risk or liability materialises (for retirement indemnities in certain countries);

certain tax losses that may be offset against tax expense in the future (i.e. tax-loss carryforwards, long-term capital losses).

Finally, if the company were to take certain decisions, it would have to pay additional tax. These taxes represent **contingent tax liabilities**, e.g. stemming from the distribution of reserves on which tax has not been paid at the standard rate.

2/ HOW ARE THEY ACCOUNTED FOR?

It is mandatory for companies to recognise all their deferred tax liabilities in consolidated accounts. Deferred tax assets arising from tax losses should be recognised when it is probable that the deferred tax asset can be used to reduce tax to be paid.

Deferred tax liabilities are not recognised on goodwill where goodwill depreciation is not deductible for tax purposes, as is the case in the UK, Italy or France. Likewise, they are not recorded in respect of tax payable by the consolidating company on distributions (e.g. dividend withholding tax) since they are taken directly to shareholders' equity.

In some more unusual circumstances, the temporary\ePubPageBreak?> difference relates to a transaction that directly affects shareholders' equity (e.g. a change in accounting method), in which case the temporary difference will also be set off against the company's shareholders' equity.

IFRS does not permit the discounting of deferred tax assets and liabilities to net present value.

Deferred tax is not the same as **contingent taxation**, which reflects the tax payable by the company if it takes certain decisions. As examples one may think about tax charges payable if certain reserves are distributed (i.e. dividend withholding tax), or if assets are sold and a capital gain is registered, etc. The principle governing contingent taxation is straightforward: it is not recorded on the balance sheet and no charge appears on the income statement.

3/ HOW SHOULD FINANCIAL ANALYSTS TREAT THEM?

It is important to recognise that deferred taxation does not represent an amount of tax currently due to or from the tax authorities, but consists of accounting entries with, most of the time, no economic underpinnings and with no corresponding cash flows.

(a) The simple case of losses

A group makes a pre-tax book and tax loss of 100. From a **tax point of view**, the tax due is zero. From an **accounting point of view**, and if there is reason to believe that the company is likely to make profits in the future that will enable it to use this tax-loss carryforward, then the loss will be reduced by a tax credit of 25.[5] Accordingly, the after-tax loss will be booked at 75. In order to balance the books, a tax credit carryforward of 25 will be recognised in the balance sheet on the assets side.

The following year, if our group makes an accounting and taxable profit of 100, it will not pay any tax, as the tax-loss carryforward created that year will be set off against the tax due. From an accounting point of view, we'll recognise a theoretical tax expense of 25 and reduce the deferred tax recognised previously in the balance sheet to 0.

This example clearly shows that the deferred tax credit was created by reducing the amount of the net accounting loss and thus increasing equity by the same amount. From a financial point of view, it is only of value if future operations are able to generate enough profits. But under no circumstances can it be considered as an ordinary asset that could be sold for cash. And it is most certainly not an element of working capital as it does not result from the time lapse between the billing date and the payment

date. We'll consider it as a fixed asset. At worst, it could be reversed against shareholders' equity, if there are serious doubts about the company's future ability to make profits.

(b) The case of provisions that are not immediately tax-deductible

In some countries, provisions for retirement benefits, restructuring and environmental risks are not tax-deductible when they are recognised. They are only tax-deductible when the related expense is paid. The accounting rule for consolidated accounts is different because allocations to these provisions are treated as tax-deductible when they are recognised. This is what results in the gap between real flows and the accounting treatment.

Let's consider a group that is making pre-tax profits of 100 per year. This year, it must allocate 100 to a reserve to cover a risk that may materialise in three years. From a **tax point of view**, the net result is 75[6] as the reserve is not tax-deductible and the tax recognised is 25. From an **accounting point of view**, as the reserve of 100 is a cost, the net result is 0. The tax effectively paid (25) appears on the income statement but is neutralised by a deferred tax income of 25, which, in order to balance the books, is also recorded on the assets side of the balance sheet. Finally, the net tax recorded on the income statement is 0.

In three years, all other things being equal, the net tax result is 0 since the cost is tax-deductible and the tax effectively paid that year is thus 0. From an accounting point of view, the written-back provision cancels out the expense, so the pre-tax result is 100 − 100 (cost) + 100 (provision written back) = 100. The tax recognised by accountants is 25, which is split into 0 tax paid and 25 recognised through deduction from the deferred tax credit recognised in the balance sheet three years ago, which is thus used up.

The deferred tax credit carried on the balance sheet for three years has a cross-entry under equity capital that is higher by 25. This is tax that has already been paid but from an accounting point of view is considered as a future expense. Unlike inventories of raw materials, which have been paid for and which are also a future expense, deferred tax has no monetary value.

The financial treatment we advocate is simple: it is cancelled from assets and deducted from the provision under liabilities (so that it appears after

tax) or from equity to reverse the initial entry.

(c) Revaluing assets

Revaluing an asset when it is first consolidated or subsequently (when tested for impairment)[7] has two consequences:

The taxable capital gains if the asset is sold will be different from the book value of the capital gains recorded in the consolidated financial statements.

The basis for depreciation will be different, and will thus generate deferred taxes.

A group acquires a new subsidiary that has land recorded on its balance sheet at its initial acquisition value of 100. This land is revalued in the consolidated financial statements at 150.

We will then book a deferred tax liability of (150 − 100) × 25% = 12.5 in the consolidated financial statements. What is this liability from an economic point of view? It is the difference that will be booked in the consolidated financial statements between the tax actually paid on the day when the land is sold at a price of P: (P − 100) × 25% and the tax that will be recognised (P − 150) × 25%. The cross-entry on the balance sheet for this deferred tax is a lesser reduction of goodwill, which is reduced not by 50 but by (50 – 12.5).

Is this a debt owed to the tax administration? Clearly not, since the land would have to be sold for a tax liability to appear and then for an amount of (P − 100) × 25% and probably not 12.5! How do we advise our readers to treat this deferred tax liability? Deduct it from goodwill.

So, what of the case of the asset that has been revalued but that is depreciable? There is an initial recognition of the deferred tax liability being gradually reduced over the duration of the residual life of the asset by deferred tax credits due to the difference between a tax depreciation calculated on the basis of 100 and book depreciation calculated on the basis of 150.

Section 7.7 DILUTION PROFIT AND LOSSES

1/ WHAT ARE DILUTION PROFIT AND LOSSES?

Where a parent company does not subscribe either at all or only partially to a capital increase by one of its subsidiaries that takes place at a value above the subsidiary's book value, the parent company records a **dilution profit**.

Likewise, if the valuation of the subsidiary for the purpose of the capital increase is less than its book value, the parent company records a **dilution loss**.

2/ HOW ARE THEY ACCOUNTED FOR?

For instance, let us consider the case of a parent company that has paid 200 for a 50% shareholding in a subsidiary with shareholders' equity of 100. A capital increase of 80 then takes place, valuing the subsidiary at a total of 400. Since the parent company does not take up its allocation, its shareholding is diluted from 50% to 41.67%.

The parent company's share of the subsidiary's equity increases from 50% × 100 = 50 to 41.67% × (100 + 80) = 75, which generates a non-recurrent gain of 75 − 50 = 25. This profit of 25 corresponds exactly to the profit that the parent company would have made by selling an interest of 50% − 41.67% = 8.33% based on a valuation of 400 and a cost price of 100 for 100%, since 25 = 8.33% × (400 − 100).

3/ HOW SHOULD FINANCIAL ANALYSTS TREAT THEM?

Dilution gains and losses generate an accounting profit, whereas the parent company has not received any cash payments. They are, by their very nature, non-recurring. Otherwise, the group would soon not have any subsidiaries left. Naturally, they do not form part of a company's normal earnings power and so they should be totally disregarded.

Section 7.8 FINANCIAL HEDGING INSTRUMENTS

1/ WHAT ARE FINANCIAL HEDGING INSTRUMENTS?

Their purpose is to hedge against a financial risk linked to a variation in exchange rates, interest rates, raw materials prices, etc. (see Chapter 51). This may arise out of a commercial operation (receivable in foreign currency, for example, or a financial operation – such as a debt at a variable rate). They rely on derivatives such as options, futures, swaps, etc. (see Chapter 51).

2/ HOW ARE THEY ACCOUNTED FOR?

Accounting for financial hedging instruments made up of derivatives (options, futures, swaps, etc.) is very complicated.

Oversimplifying it, the basic principle is that financial hedging instruments must be booked on the balance sheet at their fair value (which is generally their market value) and changes in value must be booked as income or expense in the P&L.

Nevertheless, if financial products are acquired to hedge against a specific risk, then a system known as hedge accounting can be put in place in a proportion for which the company is able to prove (and document) that the hedge is adjusted (amount, duration) to the underlying amount. The remainder will not qualify for hedge accounting and variations in value will appear on the income statement.

IFRS distinguishes between two types of hedge:

fair value hedge, and

cash flow hedge.

The difference between the two is not always that clear. For example, hedging against a foreign exchange risk of a receivable in dollars could be considered to be a fair value hedge since it is used to secure the value of this receivable or as a cash flow hedge guaranteeing the counter value of the effective payment by the client.

(a) Fair value hedges

On principle, receivables and debts are booked at their historic cost (amortised cost) while financial instruments are booked at their fair value. The application of these principles could lead to an absurd situation. Let's take, for example, a company that hedges a fixed-rate debt with a swap. If the company closes its financial year before the debt matures, the change in the value of the debt has no impact on the income statement, while the change in the value of the swap does impact the income statement. This is so even though both can set each other off!

In order to remedy this problem, IFRS recommends booking the changes in value of a receivable or a debt hedged by a financial instrument on the income statement. In this way, the gains or losses on the underlying asset are set off by the losses or gains on the hedging instrument. And there is no impact on the result.

(b) Cash flow hedges

Let's take the example of a chocolate producer that hedges the future price of cocoa with a forward purchase. The company closes its financial year after putting the hedging in place but before the actual purchase of the cocoa. If the price of cocoa has fallen since the hedging was put in place, then the principle of fair value applied to financial instruments holds that the company should book a loss in terms of the change in the value of the forward contract. This isn't logical as this loss only exists because the company wanted to be sure that the price at which it was to purchase its cocoa was fixed in advance so as to eliminate its risk.

The change in value of the financial hedging instrument is booked on the asset side and under equity (under “other comprehensive income”) without a loss or a gain being recorded on the income statement. Gains and losses on the hedging instrument only appear when underlying flows effectively take place, i.e. at the time of the effective purchase of the cocoa in our example. Our producer will then record a total expense (purchase price of cocoa lower than forecast and loss on the forward contract), which will reflect the price fixed in advance in its hedging contract.

3/ HOW SHOULD FINANCIAL ANALYSTS TREAT THEM?

Before all else, financial managers must try to check that the financial instruments are not linked to speculative transactions (and this independently of the accounting option that was possible). They should also try to divide hedging operations into commercial operations and financial operations.

Accordingly, it would be logical to integrate into EBIT the changes in the value of financial instruments if these were contracted to hedge operating receivables or debts. The balance of assets/liabilities of financial instruments must then be included in capital employed (generally under working capital).

If the financial instruments are hedging placements or financial debts, then they should be attached to net debt (on the balance sheet) and the change in their value to the income statement.

Section 7.9 IMPAIRMENT LOSSES

1/ WHAT ARE IMPAIRMENT LOSSES?

Impairment losses are set aside to cover capital losses, or those that may be reasonably anticipated, on assets. They can be incurred on goodwill, other intangible assets[8] and tangible assets.

2/ HOW ARE THEY ACCOUNTED FOR?

Impairment losses are computed based on the value of cash generating units (CGUs).[9] The firm needs to define a maximum number of largely independent CGUs and allocate assets for each one. Each year, the recoverable value of the CGU is computed if there is an indication that there might be a decrease in value or if it includes goodwill. If the recoverable value of the CGU is lower than the carrying amount, then an impairment loss needs to be recognised. Impairment is first allocated to goodwill (if any) and then among the other assets.

The recoverable value is defined as the highest of:

the value in use, i.e. the present value of the cash flows expected to be realised from the asset;

the net selling price, i.e. the amount obtainable from the sale of an asset in an arm's-length transaction[10] less the costs of disposal.

If the value of the CGU increases again, then the impairment can be reversed on all assets but goodwill.

3/ HOW SHOULD FINANCIAL ANALYSTS TREAT THEM?

Impairment losses are netted off directly against assets, and provided that these losses are justified, there is no need for any restatements. Conversely, we regard impairment losses on tangible assets as non-recurring items. As discussed on page 81, we consider impairment losses on intangible fixed assets (including goodwill) as non-operating items to be excluded from EBITDA and EBIT.[11]

Section 7.10 INTANGIBLE FIXED ASSETS

Under IFRS, these primarily encompass capitalised development costs, patents, licences, concessions and similar rights, leasehold rights, brands, software and goodwill arising on acquisitions (see Chapter 6).

This line item requires special attention since companies have some degree of latitude in treating these items that now represent a significant portion of companies' balance sheets.

Under IFRS, a company is required to recognise an intangible asset (at cost) if and only if:

it is probable that the future economic benefits that are attributable to the asset will flow to the company; and if

the cost of the asset can be reliably measured.

Internally generated goodwill, brands, mastheads, publishing titles and customer lists should not be recognised as intangible assets. Internally generated goodwill is expensed as incurred. Costs of starting up a business, of training, of advertising, of relocating or reorganising a company receive the same treatment.

1/ START-UP COSTS

(a) What are start-up costs?

Start-up costs are costs incurred in relation to the creation and the development of a company, such as incorporation, customer canvassing and advertising costs incurred when the business first starts operating, together with capital increases, merger and conversion fees.

(b) How are they accounted for?

Start-up costs are to be expensed as incurred under IFRS and US GAAP.

(c) How should financial analysts treat them?

It is easy to analyse such costs from a financial perspective. They have no value and should thus be deducted from the company's shareholders' equity.

2/ RESEARCH AND DEVELOPMENT COSTS

(a) What are research and development costs?

These costs are those incurred by a company on research and development **for its own benefit**.

(b) How are they accounted for?

Under IFRS, research costs are expensed as incurred in line with the conservatism principle governing the unpredictable nature of such activities.

Development costs should be capitalised on the balance sheet if the following conditions are met:

the project or product is clearly identifiable and its costs measurable;

the product's feasibility can be demonstrated;

the company intends to produce, market or use the product or project;

the existence of a market for the project or product can be demonstrated;

the utility of the product for the company, where it is intended for internal use, can be demonstrated;

the company has or will have the resources to see the project through to completion and use or market the end product.

Under US GAAP, research and development costs generally cannot be capitalised (except specific web developments).

(c) How should financial analysts treat them?

We recommend leaving development costs in intangible fixed assets, while monitoring closely any increases in this category, since those could represent an attempt to hide losses.

3/ BRANDS AND MARKET SHARE

(a) What are brands and market share?

These are brands or market share purchased from third parties and valued, when allowed, upon their first-time consolidation by their new parent company.

(b) How are they accounted for?

Brands are not valued in the accounts unless they have been acquired. This gives rise to an accounting deficiency, which is especially critical in the mass consumer (e.g. food, textiles, automotive sectors) and luxury goods industries, particularly from a valuation standpoint. Brands have considerable value, so it makes no sense whatsoever not to take them into account in a company valuation. As we saw in Chapter 6, the allocation of goodwill on first-time consolidation to brands and market share leads to an accumulation of such assets on groups' balance sheets. For instance, LVMH carries brands for €16bn on its balance sheet, which thus account for 36% of its capital employed. Since the amortisation of brands is not tax-deductible in most countries, it has become common practice not to amortise such assets so that they have an indefinite life. Brands are, at most, written down where appropriate.

Under IFRS, market share cannot be carried on the balance sheet and neither can training or advertising expenses, which are consequently part of goodwill but not individually identified as such.

Intangible assets with finite lives are amortised over their useful life. Intangible assets with indefinite lives undergo an impairment test each year to verify that their net book value is consistent with the recoverable value of the corresponding assets (see Section 7.9).

US rules are very similar to the IASB's.

(c) How should financial analysts treat them?

These items usually add considerably to a company's valuation, even though they may be intangible. For instance, what value would a top fashion house or a consumer goods company have without its brands?

That said, the value of brands, goodwill and shareholdings recorded on the balance sheet will be questionable if the company's profitability is low because their economic rationale is precisely to provide additional profitability.

4/ CONCLUSION

To sum up, our approach to intangible fixed items is as follows: the higher the book value of intangibles, the lower their market value is likely to be; and the lower their book value, the more valuable they are likely to be. This situation is attributable to the accounting and financial policy of a profitable company that seeks to minimise its tax expense as much as possible by expensing every possible cost. Conversely, an ailing company or one that has made a very large acquisition may seek to maximise its intangible assets in order to keep its net profit and shareholders' equity in positive territory.

From a financial standpoint, intangible fixed assets form a key part of a company's value. That said, we believe that their book value in a company's balance sheet has little to do with financial reality. Some are on the balance sheet because they were acquired, others are not because they were created by the company. Where is the logic?

Section 7.11 INVENTORIES

1/ WHAT ARE INVENTORIES?

Inventories include items used as part of the company's operating cycle. More specifically, they are:

used up in the production process (inventories of raw materials);

sold as they are (inventories of finished goods or goods for resale) or sold at the end of a transformation process that is either under way or will take place in the future (work in progress).

2/ HOW ARE THEY ACCOUNTED FOR?

(a) Costs that should be included in inventories

The way inventories are valued varies according to their nature: supplies of raw materials and goods for resale or finished products and work in progress. Supplies are valued at acquisition cost, including the purchase price before taxes, customs duties and costs related to the purchase and the delivery. Finished products and work in progress are valued at production cost, which includes the acquisition cost of raw materials used, direct and indirect production costs insofar as the latter may reasonably be allocated to the production of an item.

Costs must be calculated based on normal levels of activity, since allocating the costs of below-par business levels would be equivalent to deferring losses to future periods and artificially inflating profit for the current year. In practice, this calculation is not always properly performed, so we would advise readers to closely follow the cost allocation.

Financial charges, development costs and general and administrative costs are not usually included in the valuation of inventories unless specific operating conditions justify such a decision. IFRS requires interim interest payments[12] to be included in the cost of inventories; US GAAP allows interim interest payments to be included in inventories in certain cases.

In all sectors of activity where inventories account for a significant proportion of the assets, we would strongly urge readers to study closely the impact of inventory valuation methods on the company's net income.

(b) Valuation methods

Under IFRS, there are three main methods for valuing inventories:

the weighted average cost method;

the FIFO (first in, first out) method;

the identified purchase cost method.

Weighted average cost consists of valuing items withdrawn from the inventory at their weighted average cost, which is equal to the total purchase cost divided by quantities purchased.

The **FIFO** method values inventory withdrawals at the cost of the item that has been held in inventory for the longest.

The **identified purchase cost** is used for non-interchangeable items and goods or services produced and assigned to specific projects.

For items that are interchangeable, the IASB allows the weighted average cost and FIFO methods, but no longer accepts the LIFO method (last in, first out) that values inventory withdrawals at the cost of the most recent addition to the inventory. US GAAP permits all methods (including LIFO) but the identified purchase cost method.

During periods of inflation, the FIFO method enables a company to post a higher profit than under the LIFO method. The FIFO method values items withdrawn from the inventory at the purchase cost of the items that were held for longest and thus at the lowest cost, hence giving a higher net income. The LIFO method produces a smaller net income as it values items withdrawn from the inventory at the most recent, and thus the highest, purchase cost. The net income figure generated by the weighted average cost method lies midway between these two figures.

Analysts need to be particularly careful when a company changes its inventory valuation method. These changes, which must be disclosed and justified in the notes to the accounts, make it harder to carry out comparisons between periods and may artificially inflate net profit or help to curb a loss.

Finally, where the market value of an inventory item is less than its calculated carrying amount, the company is obliged to recognise an impairment loss for the difference (i.e. an impairment loss on current assets).

3/ HOW SHOULD FINANCIAL ANALYSTS TREAT THEM?

Firstly, let us reiterate the importance of inventories from a financial standpoint. Inventories are assets booked by recognising deferred costs, hence excluded from the income statement. Assuming quantities remain unchanged, the higher the carrying amount of inventories, the lower future profits will be. Put more precisely, assuming inventory volumes remain constant in real terms, **valuation methods do not affect net profit for a given period**. But, depending on the method used, inventory receives a higher or lower valuation, making shareholders' equity simply higher or lower accordingly.

> When inventories are being built up, the higher the carrying amount of inventories, the faster profits will appear. The reverse is true when inventories are decreasing. Overvalued inventories that are being run down generate a fall in net income.

Hence the reluctance of certain companies to scale down their production even when demand contracts. Finally, we note that, tax-related effects apart, inventory valuation methods have no impact on a company's cash position.

From a financial standpoint, it is true to say that the higher the level of inventories, the greater the vulnerability and uncertainty affecting net income for the given period. We recommend adopting a cash-oriented approach if, in addition, there is no market serving as a point of reference for valuing inventories, such as in the building and public infrastructure sectors, for instance. In such circumstances, cash generated by operating

activities is a much more reliable indicator than net income, which is much too heavily influenced by the application of inventory valuation methods.

> Inventories are merely accruals (deferred costs), which are always slightly speculative and arbitrary in nature, even when accounting rules are applied bona fide.

Consequently, **during inflationary periods**, inventories carry unrealised capital gains that are larger when inventories are moving more slowly. In the accounts, these gains will appear only as these inventories are being sold, even though these gains are there already. When prices are falling, inventories carry real losses that will appear only gradually in the accounts, unless the company writes down inventories, as was done by ArcelorMittal in 2015, 2019 and 2020, for example.

The only financial approach that makes sense would be to work on a replacement cost basis and thus to recognise gains and losses incurred on inventories each year. In some sectors of activity where inventories move very slowly, this approach seems particularly important. In the early 2010s Italian banks carried loans on their books for amounts that were well above their value. We firmly believe that had loans been written down to their market value, the ensuing crisis in the sector would have been less severe. The Italian banks would have recognised losses in one year and then posted decent profits the next, instead of resorting to all kinds of creative solutions to spread losses over several years, earning them the reputation of a perpetually sick man.

Section 7.12 LEASES

1/ WHAT ARE LEASES?

One must distinguish between operating leases allowing a company to use some of its operating fixed assets (i.e. buildings, plant and other fixed assets) under a rental system, and finance or capital leases allowing the company to purchase the asset at the end of the rental contract for a predetermined and usually very low amount (see page 377).

Finance leases raise two relatively complicated problems for external financial analysts:

Firstly, leases are used by companies to finance the assets. Even if those items may not appear on the balance sheet, they may represent a considerable part of a company's assets.

Secondly, they represent a commitment, the extent of which varies depending on the type of contract:

- equipment leasing may be treated as similar to debt depending on the length of the period during which the agreement may not be terminated;
- real-estate leasing for buildings may not be treated as actual debt in view of the termination clause contained in the contract. Nonetheless, the utility of the leased property usually leads the company to see out the initially determined length of the lease, and the termination of the lease may then be treated as the early repayment of a borrowing (financed by the sale of the relevant asset).

2/ HOW ARE THEY ACCOUNTED FOR?

A lease is either a **finance lease**[13] or an **operating lease**.

The distinction between operating or financial leases depends on whether or not a purchase option exists, on the length of the contract (greater than or equal to 75% of the life of the asset) and the present value of the rents in relation to the value of the asset (greater than or equal to 90% of the value).

Under IFRS, and since the application of IRFS 16 beginning in 2019, companies no longer distinguish between financial and operating leases. All leases must be recognised as tangible fixed assets on their balance sheets,

whenever the length of the contract is longer than one year, is for an asset worth more than €5,000, where the rent is not indexed to a variable indicator of the company such as sales made in the rented property (store, cinema), and in instances where the contract cannot be considered as a service, for example renting 1,000 sq. m of storage space in a hangar, without knowing the precise area in the hangar for the products.

To determine the value to be recorded as a right of use in the balance sheet, one must discount the expected rents over the probable duration of the lease. The discount rate is either the implicit interest rate contained within the (financial) lease or the marginal interest rate at which the company could incur debt to finance the acquisition of the operating asset. The asset is then depreciated on a straight-line basis over the life of the lease. As a counterparty to this new asset, the company records a new financial debt in its liabilities. This debt is reduced each year by an amount corresponding to the rent paid less financial expenses calculated, using the aforementioned interest rate. In the first few years, the rental debt is therefore higher than the value of the rental asset.

In the income statement, the rental expense is removed from other external expenses. Two items appear: financial expenses, generated by the rental debt sitting on the balance sheet at the given interest rate, and a depreciation expense stemming from usage rights and amortised over the length retained for the rental contract. The sum of these two expenses is frequently different to that of the rent paid, exceeding it at the beginning of the contract, and below it at the end of the contract. Initially, it would *appear as if* the EBITDA is inflated by the amount of the rent, and the operating result by the amount of the financial expenses. We will come back to this shortly.

In the cash flow statement, operating cash flow increases by the amount of the depreciation expense on the leased assets. Here, we allow readers to stop and pinch themselves. No, they are not dreaming: a change in accounting rules, which does not physically change cash flows, nevertheless changes the operating cash flows in the IFRS cash flow statements!

As the IASB is unfortunately unable to make cash magically appear in cash registers, the final reconciliation is done in the financing cash flows with a pseudo cash outflow created due to the reduction in rental debts.

Under US accounting standards, a usage right is recorded in the balance sheet under fixed assets with a corresponding financial lease liability. But under a widespread consensus, American groups identify operating lease rents in the income and cash flow statements as an operating expense and will continue to treat financial leases as financial leases. The decrease in the value of usage rights is carried out on the balance sheet by a parallel reduction in the rental debt.

Therefore, it is no longer possible to compare EBITDA or operating margins between US groups and groups operating under IFRS.

3/ HOW SHOULD FINANCIAL ANALYSTS TREAT THEM?

The reader should beware of a company with large operating leases. They add fixed costs to its income statement and raise its breakeven point.

As finance leases are a real debt, it is logical to capitalise the assets financed in this way in the balance sheet and to add the value of rental commitments made to financial debts. When this is not done in the financial statements, they should be restated in this way using the information provided in the notes.

On the other hand, since operating leases do not correspond, with a few exceptions, to a real debt, the new IFRS (and American) accounting standards do not seem, to us, to provide a fair view of the company's situation. Ideally, the analyst should revert to a distinction between operating leases (not treated as debt) and financial leases (treated as debt) by reversing the effects of IFRS 16 on the financial statements.[14]

Section 7.13 OFF-BALANCE-SHEET COMMITMENTS

1/ WHAT ARE OFF-BALANCE-SHEET COMMITMENTS?

The balance sheet shows all the items resulting from transactions that were realised. But it is hard to show in company accounts transactions that have not yet been realised, commitments that have been made but will not necessarily come into effect (e.g. the remaining payments due under an operating lease, orders placed but not yet recorded or paid for because the goods have not yet been delivered, deposits). However, such items may have a significant impact on a company's financial position.

2/ HOW ARE THEY ACCOUNTED FOR?

These commitments may have:

a positive impact – they are not recorded on the balance sheet, but are stated in the notes to the accounts, hence the term “off-balance-sheet”. These are known as **contingent assets**; or

a negative impact – they cause a provision to be set aside if they are likely to be realised, or they give rise to a note to the accounts if they remain a possibility only. These are called **contingent liabilities**.

3/ HOW SHOULD FINANCIAL ANALYSTS TREAT THEM?

Analysts should always be concerned that a company may show some items as off-balance-sheet entries while they should actually appear on the balance sheet. It is therefore very important to analyse off-balance-sheet items because they reflect:

the degree of accounting ingenuity used by the company; this judgement provides the basis for an opinion about the quality of the published accounts;

the impending arrival on the balance sheet of the effects of the commitments (e.g. purchases of fixed assets or purchase commitments that will have to be financed with debt, guarantees given to a failed third party that will lead to losses and payments with nothing received in return).

The key points to watch are as follows:

	Item	Comments
Financial commitments	Pledges and guarantees granted (including representations and warranties on disposal of an asset, product warranties). Commitments given as partners, whether unlimited or not, put options written on assets. Clawback commitments.	Analyse the situation of the relevant entity to estimate the size of the commitment.
Liabilities	Debts backed by tangible collateral.	Reflects lenders' confidence in the company.
Other	Orders to suppliers of fixed assets and other purchase commitments.	These will alter the balance sheet in the short term.

Section 7.14 PENSIONS AND OTHER EMPLOYEE BENEFITS

1/ WHAT ARE PROVISIONS FOR EMPLOYEE BENEFITS AND PENSIONS?

Pension and related commitments include severance payments, early retirement and related payments, special retirement plans, top-up plans providing guaranteed resources and healthcare benefits, life insurance and similar entitlements that, in some cases, are granted under employment contracts and collective labour agreements.

A distinction is made between:

defined benefit plans, where the employer commits to the amount or guarantees the level of benefits defined by the agreement. This is a commitment to a certain level of performance, usually according to the final salary and length of service of the retiring employee. These plans may be managed internally or externally;

defined contribution plans, where the employer commits to making regular payments to an external organisation. Those payments are paid back to employees when they retire in the form of pensions together with the corresponding investment revenue. The size of the pension payments depends on the investment performance of the external organisation managing the plan. The employer does not guarantee the level of the pension paid (a resource-related obligation). This applies to most national social security systems.

2/ HOW ARE THEY ACCOUNTED FOR?

Defined contribution plans are fairly simple to account for as contributions to these plans are expensed each year as they are incurred.

Defined benefit plans require account holders to disclose detailed and specific information. A defined benefit plan gives rise to a liability corresponding to the **actuarial present value of all the pension payments due at the balance sheet closing date** (defined benefit obligation or, in US GAAP, projected benefit obligation – PBO).

In countries where independent pension funds handle the company's commitments to its workforce, the market value of the pension fund's assets is set off against the actuarial value of the liability, and the difference, if any, normally gives rise to a pension provision. The method used to assess the actuarial value is the projected unit credit method, which models the benefits vested with the entire workforce of the company at the assessment date. It is based on certain demographics, staff turnover and other assumptions (resignations, redundancies, mortality rates, etc.). The discount rate used is the yield on high-grade corporate bonds, in practice those rated AA.

Consequently, the net pension costs in the income statement for a given year are mainly composed of:

a service cost, which represents the present value of benefits earned by employees during the year;

an interest cost, which represents the increase in the present value of the pensions payments due at the balance sheet closing date since the previous year due to the passage of time – this is generally recognised in financial expense;

a theoretical return on assets, computed using the discount rate used to compute the present value of pension payments due[15];

other non-recurring items.

In a move that has broadened the debate, the IASB have stipulated that all benefits payable to employees (i.e. retirement savings, pensions, insurance and healthcare cover and severance payments) should be accounted for. These standards state in detail how the employee liabilities deriving from these benefits should be calculated. US accounting standards also provide for the inclusion of retirement benefits and commitments other than just pension obligations, i.e. mainly the reimbursement of medical costs by companies during the active service life of employees.

3/ HOW SHOULD FINANCIAL ANALYSTS TREAT THEM?

How, therefore, should we treat provisions for employees' benefits and pensions that may, in some cases, reach very high levels, as is often the case with German companies?

Our view is that provisions for retirement benefit plans are very similar to a financial liability vis-à-vis employees. This liability is adjusted each year to reflect the actuarial (and automatic) increase in employees' accrued benefits, just like a zero-coupon bond,[16] where the company recognises an annual financial charge that is not paid until the bond is redeemed.

Consequently, we suggest treating such provisions as financial debt. When the pension provision does not cover 100% of the deficit between pension commitments and assets held to cover these commitments, the pension provision must be topped up until it is equal to this debt, which would then decrease the shareholders' equity by an equal amount. The result of the past situation is thus taken into account.

In terms of business valuation, future commitments towards its employees will be measured by discounting the annual pension service cost (discounted cash flows) or by applying a multiple (multiples method) to it. This assumes that the differences between interest costs and the theoretical return on pension assets are treated as financial charges. These must be deducted from EBITDA and EBIT and added to financial charges unless the company has already applied this rule in its accounts, as often – but not always – happens.

Section 7.15 PREFERENCE SHARES17

1/ WHAT ARE PREFERENCE SHARES?

Preference shares combine[17] characteristics of shares and bonds. They may have a fixed dividend (bonds pay interest), a redemption price (bonds) and a redemption date (bonds). If the company were to be liquidated, then the preference shareholders would be paid a given amount before the common shareholders would have a right to receive any of the proceeds. Sometimes the holders of preference shares may participate in earnings beyond the ordinary dividend rate, or have a cumulative feature allowing their dividends in arrears, if any, to be paid in full before shareholders can get a dividend, and so on.

Most of the time, in exchange for these financial advantages, the preference shares have no voting rights. They are known as *actions de préférence* in France, *Vorzugsaktien* in Germany, *azioni risparmio* in Italy and preferred stock in the US.[18]

2/ HOW ARE THEY ACCOUNTED FOR?

Under IFRS, preference shares are accounted for either as equity or financial debt, depending on the results of a "substance over form" analysis. If the preference share:

provides for mandatory redemption by the issuer at a fixed[19] date in the future; or

if the holder has a put option allowing him to sell the preference share back to the issuer in the future; or

if the preference share pays a fixed dividend regardless of the net income of the company;

then it is financial debt.

Under US GAAP, preference shares are treated as equity.

3/ HOW SHOULD FINANCIAL ANALYSTS TREAT THEM?

Let's call a spade a spade. If the preference share meets all our criteria for consideration as equity:

returns linked solely to the company's earnings;

no repayment commitment;

claims on the company ranking last in the event of liquidation

then it is equity. If not, it is a financial debt.

Section 7.16 PROVISIONS

Provisions are set aside in anticipation of a future cost. Additions to provisions reduce net income in the year they are set aside and not in the year the corresponding cost will actually be incurred. Provisions will actually be written back the year the corresponding charge will be incurred, thereby neutralising the impact of recognising the charges in the income statement. Additions to provisions are therefore equivalent to an anticipation of costs.

1/ RESTRUCTURING PROVISIONS

(a) What are restructuring provisions?

Restructuring provisions consist of taking a heavy upfront charge against earnings in a given year to cover a restructuring programme (site closures, redundancies, etc.). The future costs of this restructuring programme are eliminated on the income statement through the gradual write-back of the provision, thereby smoothing future earnings performance.

(b) How are they accounted for?

Restructuring costs represent a liability if they derive from an obligation for a company vis-à-vis third parties or members of its workforce. This liability must arise from a decision by the relevant authority and be confirmed prior to the end of the accounting period by the announcement of this decision to third parties and the affected members of the workforce. The company must not anticipate anything more from those third parties or members of its workforce. Conversely, a relocation leading to profits further ahead in the future should not give rise to such a provision.

(c) How should financial analysts treat them?

The whole crux of the matter boils down to whether restructuring provisions should be recorded under operating or non-operating items: the former are recurrent in nature, unlike the latter. Some groups consider productivity-enhancing restructuring charges as operating items and business shutdowns as non-recurrent items. This may be acceptable when the external analyst is able to verify the breakdown between these two

categories. Other companies tend to treat the entire restructuring charge as a non-recurrent item.

Our view is that in today's world of rapid technological change and endless restructuring in one division or another, restructuring charges are usually structural in nature, which means that they should be charged against operating profit. The situation may be different for SMEs,[20] where those charges are more likely to be of a non-operating nature.

On the liability side of the balance sheet, we treat these restructuring provisions as part of the operating working capital (or non-operating working capital for SMEs).

2/ PROVISIONS FOR DECOMMISSIONING OR RESTORATION OF SITES

(a) What are provisions for decommissioning or restoration?

Some industrial groups may have commitments due to environmental constraints to decommission an industrial plant after use (nuclear plant, etc.) or restore the site after use (mine, polluted site, etc.).

(b) How are they accounted for?

In such cases, as these commitments are generally over the very long term, provisions will be booked as the net present value of future commitments.

(c) How should financial analysts treat them?

These provisions should be treated as net debt.

Section 7.17 STOCK OPTIONS

1/ WHAT ARE STOCK OPTIONS?

Stock options are options to buy existing shares or to subscribe to new shares at a fixed price. Their maturity is generally between three and ten years after their issuance. They are granted free of charge to company employees, usually senior executives. Their purpose is to motivate executives to manage the company as efficiently as possible, thereby increasing its value and delivering them a financial gain when they exercise their stock options. As we will see in Chapter 26, they represent one of the ways of aligning the interests of managers with those of shareholders.

2/ HOW ARE THEY ACCOUNTED FOR?

Under IFRS, the issuance of fully vested stock options is presumed to relate to past service, requiring the full amount of the grant-date fair value to be expensed immediately. The issuance of stock options to employees with, say, a four-year vesting period[21] is considered to relate to services over the vesting period. Therefore, the fair value of the share-based payment, determined at the grant date, should be expensed on the income statements over the vesting period. The corresponding entry is an increase in equity for the same amount.

Stock options are usually valued using standard option-pricing models,[22] with some alterations or discounts to take into account cancellations of stock options during the vesting period (some holders may resign) and conditions which may be attached to their exercise, such as the share price reaching a minimum threshold or outperforming an index.

3/ HOW SHOULD FINANCIAL ANALYSTS TREAT THEM?

Do stock options and free shares make pre-existing shareholders poorer? Yes, because the eventual exercise of stock options and the granting of free shares mean that shares are issued at a lower price than their value at the time. Of course, we could hope that granting them would lead to higher motivation and greater loyalty on the part of the company's staff, which would at least make up for the dilution. But as much as this may be true, it is very difficult to measure the positive effects, and they may go hand in

hand with the pernicious effects they can have on managers who get stock options (e.g. retention of dividends and bias in favour of the riskiest investments and debt, and that doesn't even include accounting manipulation, which is another story).

Can we say that the company gets poorer by the amount of the stock options granted freely? No, it is the shareholders who potentially get poorer while the recipients of these instruments benefit, not the company, whose assets and debts are still worth what they were.

Conceptually, an accounting charge is an item which increases the amount of a liability due, which reduces the value of an asset or which sooner or later results in cash being paid out. But here, this is not the case. The granting of stock options/free shares does not lead to any flows for the company if they are not exercised, or to new equity if they are. In a nutshell, a charge may lead to bankruptcy since sooner or later it generates a reduction in assets or an increase in debts. Granting stock options, on the other hand, strengthens the solvency of the company (and the granting of free shares certainly does not weaken it). How then can the granting of stock options or free shares be booked as a charge? For us, this just doesn't make sense.

We recommend, in terms of valuation, deducting the value of stock options from the value of capital employed in order to obtain the value of equity, without modifying the number of shares issued.

Alternatively, we can reason in fully diluted terms, as if all the options granted that are in the money were exercised and the funds collected used to buy back existing shares at their current value (treasury method, described in Section 22.5), or to pay back a part of the debt or increase available cash (funds placement method, described in Section 22.5). The number of shares will obviously be adjusted as a consequence. Options that are out of the money must receive the same treatment after having multiplied their quantity by their delta, which measures the probability that they will end their lives in the money.

Section 7.18 TANGIBLE ASSETS

1/ WHAT ARE TANGIBLE ASSETS?

Tangible assets (or property, plant and equipment)[23] comprise land, buildings, technical assets, industrial equipment and tools, other tangible assets and tangible assets in process.

Together with intangible assets, tangible assets form the backbone of a company, namely its **industrial and commercial base**.

2/ HOW ARE THEY ACCOUNTED FOR?

Tangible assets are booked at acquisition cost and depreciated over time (except for land). IFRS allows them to be revalued at fair value. The fair value option then has to be taken for a whole category of assets (e.g. real estate). This option is not widely used by companies (in particular because the annual measurement of fair values and booking of changes in fair value is complex),[24] except:

on first implementation of IFRS;

following an acquisition, where it is required for the tangible assets of the purchased company.[25]

Some tangible assets may be very substantial; they may have increased in value (e.g. a head office, a store, a plant located in an urban centre) and thus become much more valuable than their historical costs suggest. Conversely, some tangible assets have virtually no value outside the company's operations. Though it may be an exaggeration, we can say that they have no more value than certain start-up costs.

Note that certain companies also include interim financial expense into internally or externally produced fixed assets (provided that this cost is clearly identified). IFRS provides for the possibility of including borrowing costs related to the acquisition cost or the production of fixed assets when it is likely that they will give rise to future economic benefits for the company and that their cost may be assessed reliably. Under US GAAP, these financial costs must be included in the cost of fixed assets.

3/ HOW SHOULD FINANCIAL ANALYSTS TREAT THEM?

The accounting policies applied with respect to fixed assets may have a significant impact on various parameters, including the company's or group's net income and apparent solvency level.

For instance, a decision to capitalise a charge when it is allowed and record it as an asset increases net income in the corresponding year, but depresses earnings performance in subsequent periods because it leads to higher depreciation charges.

> It is clear that showing assets at historical cost, in line with the historical cost principle, does not have advantages for the analyst from a financial standpoint.

Accordingly, financial analysts need to take a much closer look at changes in fixed assets rather than fixed assets at a given point in time. The advantage of adjustments is that they are shown at their current value.

Section 7.19 TREASURY SHARES

1/ WHAT ARE TREASURY SHARES?

Treasury shares are shares that a company or its subsidiaries owns in the company itself. We will examine the potential reasons for such a situation in Chapter 37.

2/ HOW ARE THEY ACCOUNTED FOR?

Under IFRS, treasury shares are systematically deducted from shareholders' equity. If they are sold by the company in the future, the disposal price will directly increase equity, and no capital gain or loss will be recognised in the income statement.

3/ HOW SHOULD FINANCIAL ANALYSTS TREAT THEM?

Whatever their original purpose, we recommend deducting treasury shares from assets and from shareholders' equity if this has not yet been done by the accountants. From a financial standpoint, we believe that share repurchases are equivalent to a capital reduction, regardless of the legal treatment. Likewise, if the company sells back the shares, we recommend that these sales be analysed as a capital increase.

Treasury shares must thus be subtracted from the number of shares outstanding when calculating earnings per share or computing market capitalisation.

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NOTES

1 *If the company's financial year starts as of 1 January.*

2 *The completed contract method consists of recognising the sales and earnings on a project only when the project has been completed or the last batch delivered. Nonetheless, by virtue of the conservatism principle, any losses anticipated are fully provisioned. This method is thus equivalent to recognising only unrealised losses while the project is under way. It may be used in the US where the recommended method is the percentage of completion method.*

3 *See Chapter 24.*

4 *This is known as “split accounting”.*

5 *Assuming a corporation tax rate of 25%.*

6 *Assuming a corporation tax rate of 25%.*

7 *See Chapter 6.*

8 *An intangible asset with indefinite useful life to be precise.*

9 *The CGU, as defined by the IASB, is the smallest identifiable group of assets that generates cash inflows from continuing use, these cash inflows being largely independent of the cash inflows from other assets or groups of assets.*

10 *A transaction done “at arm's length” designates a transaction where two entities have acted as if they had no pre-existing relations of any kind.*

11 *Earnings before interest and taxes.*

12 *Interest on capital borrowed to finance production.*

13 *Capital lease in the US.*

14 *For more, see the Vernimmen.com Newsletter, 122, 1–4, September 2019.*

15 *The difference between the effective yield and the theoretical one is part of other comprehensive items which do not transit through the profit and loss account.*

16 *See Section 17.4, 1/ (d).*

17 *Also called preferred shares.*

18 *For more details about preference shares, see Section 24.3.*

19 *Or determinable.*

20 *Small and medium-sized enterprises.*

21 *Which means that stock options cannot be exercised for at least four years.*

22 *For more, see Section 23.5.*

23 *Known as PPE.*

24 *For tangible assets (except investment property), an increase in the value of the asset will directly impact on equity (except if it reverses a previous loss) and a loss will be accounted through the income statement.*

25 *See Section 6.2, 2/ (b).*

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PART TWO
FINANCIAL ANALYSIS AND FORECASTING

In this section, we will gradually introduce more aspects of financial analysis, including how to analyse wealth creation, investments (either in working capital or capital expenditure), their financing and profitability. But first we need to look at how to carry out an economic and strategic analysis of a company.

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Chapter 8
HOW TO PERFORM A FINANCIAL ANALYSIS

Opening up the toolbox

Before embarking on an examination of a company's accounts, readers should take the time to:

carry out a strategic and economic assessment, paying particular attention to the characteristics of the sector in which the company operates, the quality of its positions and how well its production model, distribution network and ownership structure fit with its business strategy, as well as its environmental, social and governance policies (ESG, see Chapter 1);

carefully read and critically analyse the auditors' report and the accounting rules and principles adopted by the company when preparing its accounts. These documents describe how the company's economic and financial situation is translated by means of a code (i.e. accounting) into tables of figures (accounts).

Since the aim of financial analysis is to portray a company's economic reality by going beyond just the figures, it is vital to think about what this reality is and how well it is reflected by the figures before embarking on an analysis of the accounts. Otherwise, the resulting analysis may be sterile, overly descriptive and contain very little insight. It would not identify problems until they have shown up in the numbers, i.e. after they have occurred and when it is too late for investors to sell their shares or reduce their credit exposure.

Once this preliminary task has been completed, readers can embark on the standard course of financial analysis that we suggest and use more sophisticated tools, such as credit scoring and ratings.

But first and foremost, we need to deal with the issue of what financial analysis actually is.

Section 8.1 WHAT IS FINANCIAL ANALYSIS?

1/ WHAT IS FINANCIAL ANALYSIS FOR?

Financial analysis is a tool used by existing and potential shareholders of a company, as well as lenders or rating agencies. For shareholders, financial analysis assesses whether the company is able to create value. It usually involves an analysis of the value of the share and ends with the formulation of a buy or a sell recommendation on the share. For lenders, financial analysis assesses the solvency and liquidity of a company, i.e. normally leads to an understanding of its ability to honour its commitments and repay its debts on time.

We should emphasise, however, that there are not two different sets of processes depending on whether an assessment is being carried out for shareholders or lenders. Even though the purposes are different, the techniques used are the same for the very simple reason that a value-creating company will be solvent and a value-destroying company will, sooner or later, face solvency problems. Both lenders and shareholders look very carefully at a company's cash flow statement because it shows the company's ability to repay debts to lenders and to generate free cash flows, the key value driver for shareholders.

2/ FINANCIAL ANALYSIS IS MORE PRACTICE THAN THEORY, MORE ART THAN SCIENCE

The purpose of financial analysis, which primarily involves dealing with economic and accounting data, is to provide insight into the reality of a company's situation on the basis of figures. Naturally, knowledge of an economic sector and a company and, more simply, common sense may easily replace some financial analysis techniques. Very precise conclusions may be made without sophisticated analytical techniques.

Financial analysis should be regarded as a rigorous approach to the issues faced by a business that helps rationalise the study of economic and accounting data.

Financial analysts are heavily dependent on accounting figures which do not systematically give an appropriate view of the economic and financial

reality of a company. Consequently, from time to time, they have to adjust some elements of the published accounts to make them more relevant and easier to interpret.

3/ IT REPRESENTS A RESOLUTELY GLOBAL VISION OF THE COMPANY

It is worth noting that although financial analysis carried out internally within a company and externally by an outside observer is based on different information, the logic behind it is the same in both cases. Financial analysis is intended to provide a global assessment of the company's current and future position. Indeed, an internal or external analysis seeks to study the company primarily from the standpoint of an outsider looking **to achieve a comprehensive assessment of abstract data, such as the company's strategy and its results**. Fundamentally, financial analysis is a method that helps to describe the company in broad terms on the basis of a few key points.

An analyst's effectiveness is not measured by their use of sophisticated techniques but by their ability to uncover evidence of the inaccuracy of the accounting data or of serious problems being concealed. As an example, a company's earnings power may be maintained artificially through a revaluation or through asset disposals, while the company is experiencing serious cash flow problems. In such circumstances, competent analysts will cast doubt on the company's earnings power and track down the root cause of the deterioration in profitability.

We frequently see that external analysts are able to piece together the global economic model of a company and place it in the context of its main competitors. By analysing a company's economic model over the medium term, analysts are able to detect chronic weaknesses and separate them from temporary glitches. For instance, an isolated incident may be attributable to a precise and non-recurring factor, whereas a string of incidents caused by different factors will prompt an external analyst to look for more fundamental problems likely to affect the company as a whole.

Naturally, it is impossible to appreciate the finer points of financial analysis without grasping the fact that a set of accounts represents a compromise between different concerns. Let's consider, for instance, a company that is

highly profitable because it has a very efficient operating structure, but also posts a non-recurrent profit. We see a slight deterioration in its operating ratios. In our view, it is important not to make hasty judgements. The company probably attempted to adjust the size of the exceptional gain by being very strict in the way that it accounts for operating revenues and costs.

Section 8.2 ECONOMIC ANALYSIS OF COMPANIES

An economic analysis of a company does not require cutting-edge expertise in industrial economics or encyclopaedic knowledge of economic sectors. Instead, it entails straightforward reasoning and a good deal of common sense, with an emphasis on:

analysing the company's market and its position within its market;

studying its production model;

analysing its distribution networks;

identifying what motivates the company's key people.

and, lastly, analysing the company's ESG policy.

1/ ANALYSIS OF THE COMPANY'S MARKET

Understanding the company's market generally leads analysts to reach conclusions that are important for the analysis of the company as a whole.

(a) What is a market?

First of all, a market is not an economic sector as statistics institutes, central banks or professional associations would define it. Markets and economic sectors are two completely separate concepts.

What is the market for pay-TV operators such as Netflix, Sky, HBO or Canal+? It is the entertainment market, not just the TV market. Competition comes from cinema multiplexes, DVDs and live sporting events rather than from ITV, RTL TV, CBS or TF1, which mainly sell advertising slots to advertisers seeking to target the legendary housewife below 50 years of age.

So what is a market? A market is defined by consistent behaviour, e.g. a product or service satisfying similar needs, purchased through a similar distribution network by the same customers.

A market is not the same as an economic sector. Rather, it is a niche or space in which a business has some industrial, commercial or service-oriented expertise. It is the arena in which it competes.

Once a market has been defined, it can then be segmented using geographical (i.e. local, regional, national, worldwide) and sociological (luxury, mid-range, entry-level products) variables. This is also an obvious tactic adopted by companies seeking to gain protection from their rivals. If such a tactic succeeds, a company will create its own market in which it reigns supreme. Nestlé, with its Nespresso machines and capsules, has created something unique which is more than just a product or a service but a combination of both. But before readers get carried away and rush off to create their very own market arenas, it should be remembered that a market always comes under threat sooner or later – think about the BlackBerry and smartphones.

Segmenting markets is never a problem for analysts, but it is vital to get the segmentation right! To say that a manufacturer of running shoes has a 30% share of the German running shoe market may be correct from a statistical standpoint but is totally irrelevant from an economic standpoint, because this is a worldwide market with global brands backed by marketing campaigns featuring international champions. Conversely, a 40% share of the northern Swiss cement market is a meaningful number, because cement is a heavy product with a low unit value that cannot be stored for long and is not usually transported more than 150–200 km from the cement plants.

(b) Market growth

Once a financial analyst has studied and defined a market, the natural reflex is then to attempt to assess the growth opportunities and identify the risk factors. The simplest form of growth is organic volume growth, i.e. selling more and more products or services.

That said, it is worth noting that volume growth is not always as easy as it may sound in developed countries given weak demographic growth (e.g. between −0.5% and +1% p.a. in Europe). Booming markets do exist (Internet of Things), but others are rapidly contracting (coal power plants, magazines) or are cyclical (transportation, paper production).

At the end of the day, in mature countries, the most important type of growth is value growth. Let's imagine that we sell a product satisfying a basic need, such as bread. Demand does not grow much and, if anything, appears to be declining. So we attempt to move upmarket by means of either marketing or packaging, or by innovating. As a result, we decide to switch from selling bread to providing a whole range of speciality products, such as baguettes, rye bread and farmhouse loaves, and we start charging €1.10 or even €1.30, rather than €0.90 per item. The risk of pursuing this strategy is that our rivals may react by focusing on a narrow range of straightforward, unembellished products that sell for less than ours, e.g. a small shop that bakes pre-prepared dough in its ovens or the in-store bakeries at food superstores.

Once we have analysed the type of growth, we need to attempt to predict its duration, and this is no easy task. The famous 17th-century letter writer Mme de Sévigné once forecast that coffee was just a fad and would not last for more than a week. At the other end of the spectrum, it is not uncommon to hear entrepreneurs claiming that their products will revolutionise consumers' lifestyles and even outlast the wheel!

Growth drivers in a developed economy are often highly complex. They may include:

technological advances, new products (e.g. robot vacuum cleaners);

changes in the economic situation (e.g. expansion of cruises with the rise in living standards);

changes in consumer lifestyles (e.g. food delivery services);

changing fashions (e.g. Prosecco);

demographic trends (e.g. popularity of cruises owing to the ageing of the population);

environmental considerations (e.g. electric cars, solar power);

delayed uptake of a product (e.g. mobile banking in Africa where the retail banking network is limited).

In its early days, the market evolves rapidly, as products are still poorly geared to consumers' needs. During the growth phase, the technological risk has disappeared, the market has become established and expands rapidly,

being fairly insensitive to fluctuations in the economy at large. As the market reaches maturity, sales become sensitive to ups and downs in general economic conditions. And as the market ages and goes into decline, price competition increases, and certain market participants fall by the wayside. Those that remain may be able to post very attractive margins, and no more investment is required.

Lastly, readers should note that an expanding sector is not necessarily an attractive sector from a financial standpoint. Where future growth has been over-estimated, supply exceeds demand, even when growth is strong, and all market participants lose money (e.g. the 3D printer industry). Conversely, tobacco, which is one of the most mature markets in existence, generates a very high level of return on capital employed for the last few remaining companies operating in the sector.

(c) Market risk

Market risk varies according to whether the product in question is original equipment or a replacement item. A product sold as original equipment will seem more compelling in the eyes of consumers who do not already possess it. And it is the role of advertising to make sure this is how they feel. Conversely, should consumers already own a product, they will always be tempted to delay replacing it until their conditions improve and thus will spend their limited funds on another new product. Needs come first! Put another way, replacement products are much more sensitive to general economic conditions than original equipment. For instance, sales in the European truck industry beat all existing records in 2007 when the economy was in excellent shape, before plunging due to very poor economic conditions in 2009 (–50%), then recovering slightly in 2011–2014 and more markedly since 2015 and falling back again drastically (–30%) in 2020 and recovering in 2021.

With this in mind, it is vital for an analyst to establish whether a company's products are acquired as original equipment or as part of a replacement cycle because this directly affects the company's sensitivity to general economic conditions.

All too often we have heard analysts claim that a particular sector, such as the food industry, does not carry any risk (because we will always need to

eat!). These analysts either cannot see the risks or they disregard them. Granted, we will always need to eat and drink, but not necessarily in the same way. For instance, organic food consumption is on the increase, meat consumption is declining and consumption of vegetable proteins is growing fast.

Risk also depends on the nature of barriers to entry to the company's market and whether or not alternative products exist. Nowadays barriers to entry tend to weaken constantly owing to:

a powerful worldwide trend towards deregulation (there are fewer and fewer monopolies, e.g. in railways and postal services);

technological advances (and in particular the Internet, e-commerce marketplaces…);

a strong trend towards internationalisation.

All these factors have increased the number of potential competitors and made the barriers to entry erected by existing players far less sturdy.

For instance, the five record industry majors – Sony, Bertelsmann, Universal, Warner and EMI – had achieved worldwide domination of their market, with a combined market share of 80%. Nevertheless, they have seen their grip loosened by the development of the Internet (Spotify, Apple Music) and artists' ability to sell their products directly to consumers through music downloads – not to mention the impact of piracy!

(d) Market share

The position held by a company in its market is reflected by its market share, which indicates the share of business in the market (in volume or value terms) achieved by the company.

A company with substantial market share has the advantages of:

some degree of loyalty among its customers, who regularly make purchases from the company. As a result, the company reduces the volatility of its business;

a strong bargaining position vis-à-vis its customers and suppliers. Mass retailers in the UK are a perfect example of this;

an attractive position, which means that any small producer wishing to put itself up for sale, any inventor of a new product or new technique or any talented new graduate will usually come to see this market leader first, because a company with a large market share is a force to be reckoned with in its market.

That said, just because market share is quantifiable does not mean that the numbers are always relevant. For instance, market share is meaningless in the construction and public works market (and indeed is never calculated). Customers in this sector do not renew their purchases on a regular basis (town halls, swimming pools and roads have a long useful life). Even if they do, contracts are awarded through a bidding process, meaning that there is no special link between customers and suppliers. Likewise, building up market share by slashing prices without being able to hold onto the market share accumulated after prices are raised again is pointless. This inability demonstrates the second limit on the importance of market share: the acquisition of market share must create value, otherwise it serves no purpose.

Lastly, market share is not the same as size. For instance, a large share of a small market is far more valuable than middling sales in a vast market.

(e) The competition

If the market is expanding, it is better to have smaller rivals than several large ones with the financial and marketing clout to cream off all the market's expansion. Where possible, it is best not to try to compete against the likes of Google. Conversely, if the market has reached maturity, it is better for the few remaining companies that have specialised in particular niches to be faced with large rivals that will not take the risk of attacking them because the potential gains would be too small. Conversely, a stable market with a large number of small rivals frequently degenerates into a price war that drives some players out of business.

But since a company cannot choose its rivals, it is important to understand what drives them. Some rivals may be pursuing power or scale-related targets (e.g. biggest turnover in the industry) that are frequently far from profitability targets. Consequently, it is very hard for groups pursuing profitability targets to grow in such conditions. So how can a company

achieve profitability when its main rivals, e.g. farming cooperatives in the canned vegetables sector, are not profit-driven? It is very hard indeed because it will struggle to develop, since it will generate weak profits and thus have few resources at its disposal.

(f) How does competition work?

Roughly speaking, competition is driven either by prices or by products:

Where competition is price-driven, pricing is the main – if not the only – factor that clinches a purchase. Consequently, costs need to be kept under tight control so that products are manufactured as cheaply as possible, product lines need to be streamlined to maximise economies of scale and the production process needs to be automated as far as possible. Market share is a key success factor since higher sales volumes help keep down unit costs (see Boston Consulting Group's famous experience curve, which shows that unit costs fall by 20% when total production volumes double in size). This is where engineers and financial controllers are most at home! It applies to markets such as petrol, milk, phone calls, and so on. Incumbents beware, however, as new technological advances such as 3D printing can upset the market equilibrium currently dependent on volume maximisation to drive costs lower, by enabling low volume production at low cost, thereby enabling greater production optimisation and further cost efficiencies.

Where competition is product-driven, customers make purchases based on after-sales service, quality, image, etc., which are not necessarily price-related. Therefore, companies attempt to set themselves apart from their rivals and pay close attention to their sales and customer loyalty techniques. This is where the marketing specialists are in demand! Think about Nespresso's quality of product and service, Harrods' atmosphere or, of course, Apple.

The real world is never quite as simple, and competition is rarely only price- or product-driven but is usually dominated by one or the other or maybe even a combination of both, e.g. vitamin-enhanced milk, or the premium fuel that protects your engine.

2/ PRODUCTION

(a) Value chain

A value chain comprises all the companies involved in the manufacturing process, from the raw materials to the end product. Depending on the exact circumstances, a value chain may encompass the extraction and processing of raw materials, R&D, secondary processing, trading activities, a third or fourth processing process, further trading and lastly the end distributor. Increasingly in our service-oriented society, grey matter is the raw material, and processing is replaced by a series of services involving some degree of added value, with distribution retaining its role.

The point of analysing a value chain is to understand the role played by the market participants, as well as their respective strengths and weaknesses. Naturally, in times of crisis, all participants in the value chain come under pressure. But some of them will suffer more than others, and some may even disappear altogether because they are structurally in a weak position within the value chain. Analysts need to determine where the structural weaknesses lie. They must be able to look beyond good performance when times are good, because it may conceal such weaknesses. Analysts' ultimate goal is to identify where not to invest or not to lend within the value chain.

> When studying a value chain, analysts need to identify weaknesses where a particular category of player has no or very little room for manoeuvre (scope for developing new lines of business for selling operating assets with value independent of their current use, etc.).

(b) Production models

In a service-dominated economy, the production models used by an industrial company are rarely analysed, even though we believe this is a very worthwhile exercise.

The first step is to establish whether the company assumes responsibility for or subcontracts the production function, whether production takes place close to points of sale or whether it has been transferred to low-labour-cost countries and whether the labour force is made up of permanent or temporary staff, etc. This step allows the analyst to measure the flexibility

of the income statement in the event of a recession or strong growth in the market.

In doing so, the analyst can detect any inconsistency between the product and the industrial organisation adopted to produce it. As indicated in the following chart, there are four different types of industrial organisations:

Products: / Processes:	Unique custom-made designed for the user	Multiple, differentiated not standardised produced on demand	Diversified but made up of standardised components high volumes	Unique complex very high volumes
Project: Specific and temporary organisation comprising experts	Pyramids in Egypt Cathedrals Hubble telescope			
Workshop: Flexibility through overcapacity, not very specialised equipment, multi-skilled workforce		*Haute couture* Catering Machine tools		
Mass production: Flexibility through semi-finished inventories not very qualified or multi-skilled workforce			Consumer appliances Shoes Textiles	
Process-specific: Total lack of flexibility but no semi-finished inventories, advanced automatisation, small and highly technical workforce				Automotive Energy Sugar production Chemicals

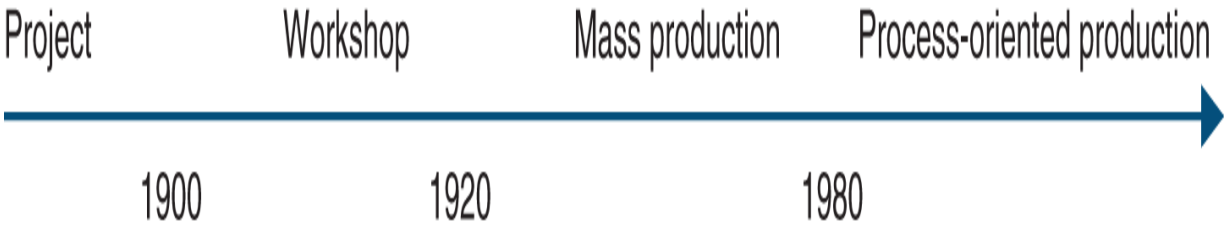
Different types of industrial organisations

The **project**-type organisation falls outside the scope of financial analysis. Although it exists, its economic impact is very modest indeed.

The **workshop** model may be adopted by craftsmen, in the luxury goods sector or for research purposes, but as soon as a product starts to develop, the workshop model should be discarded as soon as possible.

Mass production is suitable for products with a low unit cost, but gives rise to very high working capital owing to the inventories of semi-finished goods that provide its flexibility. With this type of organisation, barriers to entry are low because as soon as a process designer develops an innovative method, it can be sold to all the market players. This type of production is frequently relocated to emerging markets.

Process-specific production is a type of industrial organisation that took shape in the late 1970s and revolutionised production methods. It has led to a major decline in working capital because inventories of semi-finished goods have almost disappeared. It is a continuous production process from the raw material to the end product, which requires the suppliers, subcontractors and producers to be located close to each other and to work on a just-in-time basis. This type of production is hard to relocate to countries with low labour costs owing to its complexity (fine-tuning), and it does not provide any flexibility given the elimination of the inventories of semi-finished goods. A strike or an accident affecting a supplier or subcontractor may bring the entire group to a standstill.



The natural tendency for all industries is to evolve gradually, mirroring trends in the motor industry during the 20th century.

But readers should not allow themselves to get carried away with the details of these industrial processes. Instead, they should examine the pros and cons of each process and consider how well the company's business strategy

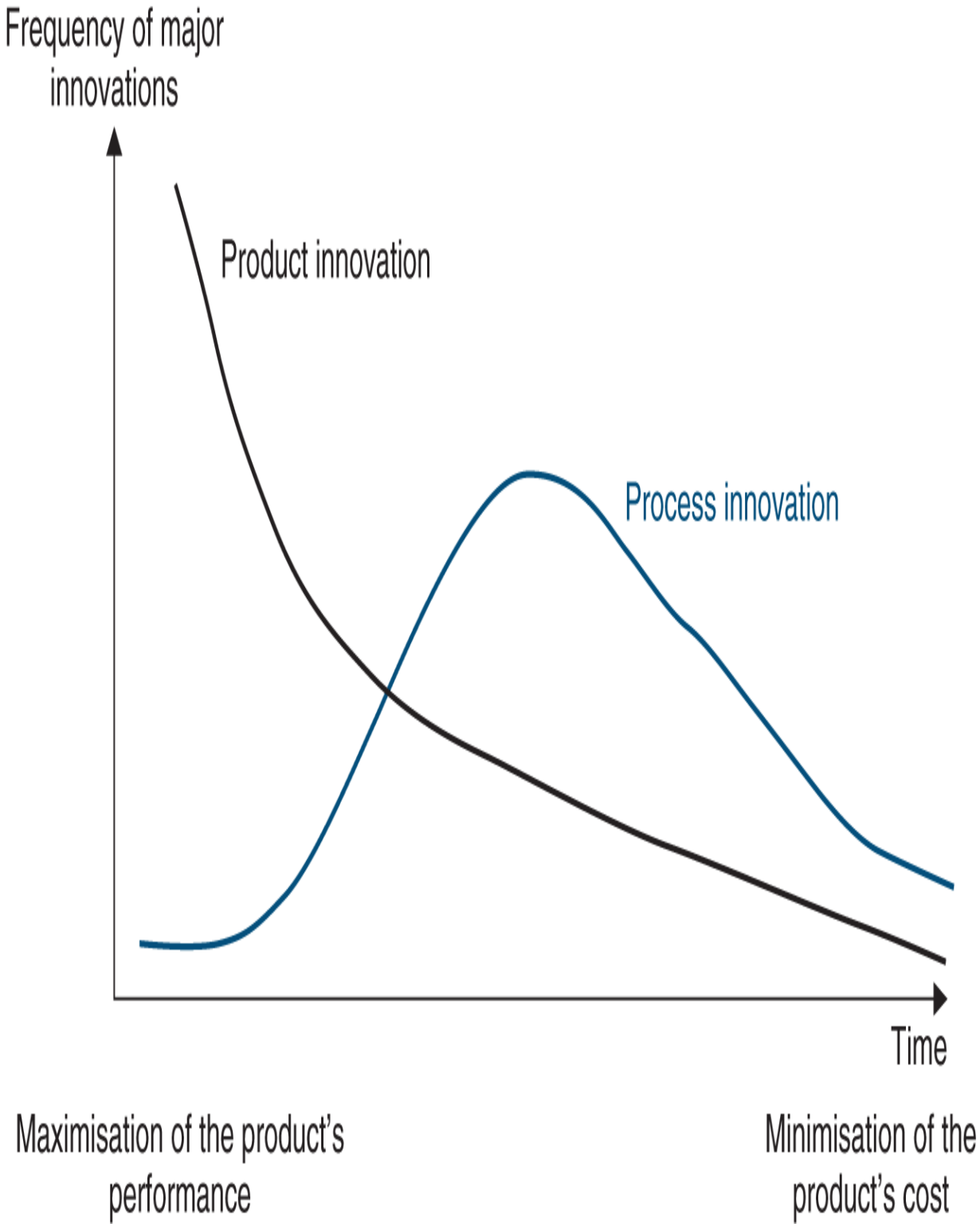
fits with its selected production model. Workshops will never be able to deliver the same volumes as mass production!

This being said, new production methods are developing (3D printing) that combine the flexibility of the workshop with the cost advantage of mass production. These methods have already gained mass adoption in certain industries (dental implants, oil and gas industry, etc.).

(c) Capital expenditure

A company should not invest too early in the production process. When a new product is launched on the market, there is an initial phase during which the product must show that it is well suited to consumers' needs. Then the product will evolve, more minor new features will be built in and its sales will increase.

From then on, the priority is to lower costs; all attention and attempts at innovation will then gradually shift from the product to the production model.



Source: Modified from Utterback and Abernathy 1975

Investing too early in the production process is a mistake for two reasons. Firstly, money should not be invested in a production process that is not yet

stable and might even have to be abandoned. Secondly, it is preferable to use the same funds to anchor the product more firmly in its market through technical innovation and marketing campaigns. Consequently, it may be wiser to outsource the production process and not incur production-related risks on top of the product risk. Conversely, once the production process has stabilised, it is in the company's best interests to invest in securing a tighter grip over the production process and unlocking productivity gains that will lead to lower costs.

More and more, companies are looking to outsource their manufacturing or service operations, thereby reducing their core expertise to project design and management. Roughly speaking, companies in the past were geared mainly to production and had a vertical organisation structure because value was concentrated in the production function. Nowadays, in a large number of sectors (telecoms equipment, IT, pharmacy, cosmetics, etc.), value lies primarily in the research, innovation and marketing functions.

Companies therefore have to be able to organise and coordinate production carried out externally. This outsourcing trend has given rise to companies such as Foxconn, Fareva and Flex, whose sole expertise is industrial manufacturing and who are able to secure low costs and prices by leveraging economies of scale because they produce items on behalf of several competing groups.

3/ DISTRIBUTION SYSTEMS

A distribution system usually plays three roles:

logistics: displaying, delivering and storing products;

advice and services: providing details about and promoting the product, providing after-sales service and circulating information between the producer and consumers, and vice versa;

financing: making firm purchases of the product, i.e. assuming the risk of poor sales.

These three roles are vital, and where the distribution system does not fulfil them or does so only partially, the producer will find itself in a very difficult position and will struggle to expand.

Let's consider the example of the retail furniture sector. It does not perform the financing role because it does not carry any inventory aside from a few demonstration items. The logistics side merely entails displaying items, and advice is limited, to say the least. As a result, the role of furniture producers is merely that of piece-workers who are unable to build their own brand (a proof of their weakness), the only well-known brands being private-label brands such as IKEA, Made.com, etc.

It is easy to say that producers and distributors have diverging interests, but this is not true. Their overriding goal is the same, i.e. that consumers buy the product. Inevitably, producers and distributors squabble over their respective share of the selling price, but that is a secondary issue. A producer will never be efficient if the distribution network is inefficient.

> The risk of a distribution network is whether it performs its role properly and whether it restricts the flow of information between the producer and consumers.

So what type of distribution system should a company choose? Naturally, this is a key decision for companies. The closer they can get to their end customers, possibly even handling the distribution role themselves, the faster and more accurately they will find out what their customers want (pricing, product ranges, innovation, etc.). And the earlier they become aware of fluctuations in trading conditions, the sooner they will be able to adjust their output. But such choice requires special human skills, investment in logistics and sales facilities and substantial working capital.

This approach makes more sense where the key factor motivating customer purchases is not pricing but the product's image, after-sales service and quality, which must be tightly controlled by the company itself rather than an external player. For instance, Apple has progressively created its own retail network and has reduced the number of third-party retailers it supplies.

Being far from end customers carries with it the opposite pros and cons. The requisite investment is minimal, but the company is less aware of its customers' preferences, and the risks associated with cyclical ups and downs are amplified. If end customers slow down their purchases, it may

take some time before the end retailer becomes aware of the trend and reduces its purchases from the wholesaler. The wholesaler will, in turn, suffer from an inertia effect before scaling down its purchases from the producer, who will not therefore have been made aware of the slowdown until several weeks or even months after it started. And when conditions pick up again, it is not unusual for distributors to run out of stock even though the producer still has vast inventories.

Where price competition predominates, it is better for the producer to focus its investment on production facilities to lower its costs, rather than to spread it thinly across a distribution network that requires different expertise from the production side.

The common use of e-commerce represents a revolution in terms of distribution. It has reshuffled the cards in what was previously an oligopolistic sector, but with fierce competition (mass retail outlets); perhaps to the benefit of what is now a de facto monopoly (Amazon). This being said, the Internet allows small producers to reach a very large target audience at a lower cost (Augustinus Bader); and despite not controlling the full scope of distribution, the proximity to the customer is often much closer than in a franchised network with numerous intermediaries. This has occurred elsewhere: after very difficult years, online streaming of music content has provided the music industry with fresh impetus.

The sheer quantity of data available on customer behaviour generated by e-commerce has become a major issue. This has become key for companies in the 21st century.

4/ THE COMPANY AND ITS PEOPLE

All too often, we have heard it said that a company's human resources are what really count. In certain cases, this is used to justify all kinds of strange decisions. There may be some truth to it in smaller companies, which do not have strategic positions and survive thanks to the personal qualities and charisma of their managers. Such a situation represents a major source of uncertainty for lenders and shareholders. To say that the men and women employed by a company are important may well be true, but management will still have to establish strategic positions and build up economic rents[1] that give some value to the company aside from its founder or manager.

(a) Shareholders

From a purely financial standpoint, the most important men and women of a company are its shareholders. They appoint its executives and determine its strategy. It is important to know who they are and what their aims are, as we will see in Chapter 41. There are two types of shareholder, namely inside and outside shareholders.

Inside shareholders are shareholders who also perform a role within the company, usually with management responsibilities. This fosters strong attachment to the company and sometimes leads to the pursuit of scale-, power- and prestige-related objectives that may have very little to do with financial targets. **Outside shareholders** do not work within the company and behave in a purely financial manner.

What sets inside shareholders apart is that they assume substantial personal risks because both their assets and income are dependent on the same source, i.e. the company. Consequently, inside shareholders usually pay closer attention than a manager who is not a shareholder and whose wealth is only partly tied up in the company. Nonetheless, the danger is that inside shareholders may not take the right decisions, e.g. to shut down a unit, dispose of a business or discontinue an unsuccessful diversification venture, owing to emotional ties or out of obstinacy. The Viacom Group would probably have fared better during the 2010s had the group's founder not clung on to his position as executive chairman well into his nineties.

Outside shareholders have a natural advantage. Because their behaviour is guided purely by financial criteria, they will serve as a very useful touchstone for the group's strategy and financial policy. That said, if the company runs into problems, they may act very passively and show a lack of resolve that will not help managers very much.

Analysts should watch out for conflicts among shareholders that may paralyse the normal life of the company. Telecom Italia's recovery has undoubtedly been slowed down since 2018 by the battle between its two main shareholders (Bolloré and the activist fund Elliott) and the frequent management changes that this has brought about.

(b) Managers

It is important to understand the managers' objectives and attitude vis-à-vis shareholders. The reader needs to bear in mind that the widespread development of share-option-based incentive systems in particular has aligned the managers' financial interests with those of shareholders. We will examine this topic in greater depth in Chapter 26.

We would advise readers to be very cautious where incentive systems have been extended to include the majority of a company's employees. Firstly, performance-based shares cannot yet be used to buy food or pay rents and so salaries must remain the main source of income for unskilled employees. Secondly, should a company's position start to deteriorate, its top talent will be fairly quick to jump ship after having sold their performance-based shares before they become worthless. Those that remain on board may fail to grasp what is happening until it is too late, thereby losing precious time. This is what happened to so-called new economy companies, which distributed stock options as a standard form of remuneration. It is an ideal system when everything is going well, but highly dangerous in the event of a crisis because it exacerbates the company's difficulties.

(c) Corporate culture

Corporate culture is probably very difficult for an outside observer to assess. Nonetheless, it represents a key factor, particularly when a company embarks on acquisitions or diversification ventures. A monolithic and highly centralised company with specific expertise in a limited number of products will struggle to diversify its businesses because it will probably seek to apply the same methods to its target, thereby disrupting the latter's impetus.

Thus, the takeover of Marionnaud, a family\ePubPageBreak?> business in the distribution of perfumes, by a Hong Kong conglomerate was a failure (Séphora has since become the market leader), because the latter's authoritarian culture was not very suitable for what has historically been a group of small merchants at heart.

On the other hand, the Despature family has successfully transformed its activities from the manufacture and distribution of Damart knitwear to the automation and motorisation of gates, doors and windows, Somfy. Its CEO had the intelligence to understand that for his situation he needed engineers

and not marketing experts to manage this diversification, which has gradually become the group's core activity.

5/ ENVIRONMENTAL, SOCIAL AND GOVERNANCE POLICY (ESG)

Depending on the company, environmental issues are more or less important. Crucial in heavy industry (ArcelorMittal, for example), significantly less so in service industries (such as WPP). But one must be wary of appearances, as some sectors can find themselves at the centre of unintuitive controversies (the energy costs generated by cryptocurrency mining).

The financial analyst must also understand the issues and politics surrounding gender, diversity and good governance (representativeness, board independence, see Chapter 43).

On these topics, the analyst must identify the issues and understand how the company manages them. They can have immediate and also long-term financial impacts on the cost of capital or the company's ability to attract the talents that will guarantee its future value.

Section 8.3 AN ASSESSMENT OF A COMPANY'S ACCOUNTING POLICY

We cannot overemphasise the importance of analysing the auditors' report and considering the accounting principles adopted before embarking on a financial analysis of a group's accounts based on the guide that we will present in Section 8.4.

If a company's accounting principles are in line with practices, then readers will be able to study the accounts with a fairly high level of assurance about their relevance, i.e. their ability to provide a decent reflection of the company's economic reality.

Conversely, if readers detect anomalies or accounting practices that depart from the norm, then there is little need to examine the accounts because they provide a distorted picture of the company's economic reality. In such circumstances, we can only advise the lender not to lend or to dispose of its loans as soon as possible and the shareholder not to buy shares or to sell any already held as soon as possible. A company that adopts accounting principles that deviate from the usual standards does not do so by chance. In all likelihood the company will be seeking to window-dress a fairly grim reality.

Section 8.4 STANDARD FINANCIAL ANALYSIS PLAN

Experience has taught us that novices are often disconcerted when faced with the task of carrying out their first financial analysis because they do not know where to start and what to aim for. They risk producing a collection of mainly descriptive comments without connecting them or verifying their internal consistency, i.e. without establishing any causal links, or mindlessly calculating a series of ratios without understanding the logic and rationale behind them.

A financial analysis is an investigation that must be carried out in a logical order. It comprises parts that are interlinked and should not therefore be carried out in isolation. Financial analysts are detectives, constantly on the lookout for clues, seeking to establish a logical sequence, as well as looking for any disruptive factor that may be a prelude to problems in the future. The questions they most often need to ask are “Is this logical? Is this consistent with what I have already found? If so, why? If not, why not?”

We suggest that readers remember the following sentence, which can be used as the basis for all types of financial analysis:

> Wealth creation requires investment that must be financed and provide sufficient return.

Let us analyse this sentence in more depth. A company will be able to remain viable and ultimately survive only if it manages to find customers ready to buy its goods or services in the long term at a price that enables it to post a sufficient operating profit. This forms the base for everything else. Consequently, it is important to look first at the structure of the company's earnings. But the company needs to make capital expenditures to start operations: acquiring equipment, buildings, patents, subsidiaries, etc. (which are fixed assets) and setting aside amounts to cover working capital. Fixed assets and working capital jointly form its capital employed. Naturally, these outlays will have to be financed either through equity or bank loans and other borrowings.

Once these three factors (margins, capital employed and financing) have been examined, the company's profitability, i.e. its efficiency, can be calculated, in terms of either its return on capital employed (ROCE) or its return on equity (ROE). This marks the end of the analyst's task and provides the answers to the original questions, i.e. Is the company able to honour the commitments it has made to its creditors? Is it able to create value for its shareholders?

Consequently, we have to study the company's:

wealth creation, by focusing on:

- trends in the company's sales, including an analysis of both prices and volumes. This is a key variable that sets the backdrop for a financial analysis. An expanding company does not face the same problems as a company in decline, in a recession, pursuing a recovery plan or experiencing exponential growth;
- the impact of business trends, the strength of the cycle and its implications in terms of volumes and prices (gap vs. those seen at the top or bottom of the cycle);
- trends in margins and particularly the EBITDA and EBIT margins;
- an examination of the scissors effect (see Chapter 9) and the operating leverage (see Chapter 10), without which the analysis is not very robust from a conceptual standpoint.

capital employed policy, i.e. capital expenditure and working capital (see Chapter 11);

financing policy: This involves examining how the company has financed capital expenditure and working capital either by means of debt, equity or internally generated cash flow. The best way of doing so is to look at the cash flow statement for a dynamic analysis and the balance sheet for a snapshot of the situation at the company's year end (see Chapter 12).

Overview of a standard plan for a financial analysis

Two preliminary tasks:

FIRSTLY, GET TO KNOW THE BUSINESS WELL...

- *The market(s)*
- *The product(s)*
- *Production model(s)*
- *Distribution network*
- *Human resources*
- *ESG policy*

↓

... AS WELL AS THE COMPANY'S ACCOUNTING POLICIES

Auditors' reports
Accounting principles

- *Consolidation techniques*
- *Goodwill, brands, etc.*
- *Provisions*
- *Inventories*
- *etc.*

Four-stage plan:

WEALTH CREATION...

- *Revenues analysis:*
  - *External / internal growth*
  - *Price / volume growth*
  - *Fx impact*
- *Margin analysis:*
  - *structure*
  - *scissors effect*
  - *breakeven effect*

↓

...REQUIRES INVESTMENTS...

- *Working capital*
- *Capital expenditures*

↓

...THAT MUST BE FINANCED

- *Equity / Debt*
- *Liquidity, interest rate and currency risk*

↓

... AND BE SUFFICIENTLY PROFITABLE

- *Analysis of return on capital employed and return on equity: leverage effect*
- *Comparison between ROCE / rate of return required by shareholders and lenders*
  - *-> Value creation*
  - *-> Solvency risk*

profitability by:

- analysing its ROCE and ROE, leverage effect and associated risk (see Chapter 13);
- comparing actual profitability with the required rate of return (on capital employed or by shareholders) to determine whether the company is creating value and whether the company is solvent (see Chapter 14).

In the following chapters we use the case of the ArcelorMittal group as an example of how to carry out a financial analysis.

ArcelorMittal is the world's largest steel group. It employs 168,000 people and recorded sales of $53,270m in 2020.

Annual reports of ArcelorMittal from 2012 to 2018 are available on the website, www.vernimmen.com.

Let's now see the various different techniques that can be used in financial analysis.

Section 8.5 THE VARIOUS TECHNIQUES OF FINANCIAL ANALYSIS

1/ TREND ANALYSIS OR THE STUDY OF THE SAME COMPANY OVER SEVERAL PERIODS

Financial analysis always takes into account trends over several years because its role is to **look at the past in order to assess the present situation and to forecast the future**. It may also be applied to projected financial statements prepared by the company. The only way of teasing out trends is to look at performance over several years (usually at least three where the information is available).

Analysts need to bring to light any possible deterioration so that they can seize on any warning signals pointing to major problems facing the company. This approach has two important drawbacks:

trend analysis only makes sense when the data are roughly comparable from one year to the next. This is not the case if the company's business activities, business model (e.g. massive use of outsourcing) or scope of consolidation change partially or entirely, not to mention any changes in the accounting rules;

accounting information is always published with a delay. Broadly speaking, the accounts for a financial year are published between one and four months after the year end, and they may no longer bear any relation to the company's present situation. In this respect, external analysts stand at a disadvantage to their internal counterparts who are able to obtain data much more rapidly if the company has an efficient information system.

2/ COMPARATIVE ANALYSIS OR COMPARING SIMILAR COMPANIES

Comparative analysis consists of evaluating a company's key profit indicators and ratios so that they can be compared with the typical (median or average) indicators and ratios of companies operating in the same sector of activity. The basic idea is that one should not get up to any more nonsense than one's neighbours, particularly when it comes to a company's balance sheet. Why is that? Simply because during a recession most of the

lame ducks will be eliminated and only healthy companies will be left standing. **A company is not viable or unviable in absolute terms. It is merely more or less viable than others.**

The comparative method is often used by financial analysts to compare the financial performance of companies operating in the same sector, by certain companies to set customer payment periods, by banks to assess the abnormal nature of certain payment periods and of certain inventory turnover rates, and by those examining a company's financial structure. It may be used systematically by drawing on the research published by organisations (such as central banks, Datastream, Standard & Poor's or Moody's, etc.) that compile the financial information supplied by a large number of companies. They publish the main financial characteristics, in a standardised format, of companies operating in different sectors of activity, as well as the norm (median or average) for each indicator or ratio in each sector. This is the realm of **benchmarking**.

This approach has two drawbacks:

The concept of sector is a vague one and depends on the level of granularity applied. This approach analyses a company based on rival firms, so to be of any value, the information compiled from the various companies in the sector must be consistent, and the sample must be sufficiently representative.

There may be cases of mass delusion, leading to all the stocks in a particular sector being temporarily overvalued. Financial investors should then withdraw from the sector.

3/ NORMATIVE ANALYSIS AND FINANCIAL RULES OF THUMB

Normative analysis represents an extension of comparative analysis. It is based on a comparison of certain company ratios or indicators with rules or standards derived from a vast sample of companies.

For instance, there are norms specific to certain industries:

in the hotel sector, the bed-per-night cost must be at least 1/1,000 of the cost of building the room, or the sales generated after three years should be at least one-third of the investment cost;

the level of work in progress relative to the company's shareholders' equity in the construction sector;

the level of sales generated per square metre in supermarkets, etc.

There are also some financial rules of thumb applicable to all companies regardless of the sector in which they operate and relating to their balance sheet structure:

fixed assets should be financed by stable sources of funds;

net debt becomes significant above three times EBITDA.

Readers should be careful not to set too much store by these norms, which are often not very robust from a conceptual standpoint because they are determined from statistical studies. These ratios are hard to interpret, except perhaps where capital structure is concerned. After all, profitable companies can afford to do what they want, and some may indeed appear to be acting rather whimsically, but profitability is what really matters. Likewise, we will illustrate in Section IV of this book that there is no such thing as an ideal capital structure.

Section 8.6 RATINGS

Credit ratings are the result of a continuous assessment of a borrower's solvency by a specialised agency (mainly Standard & Poor's, Moody's, Fitch, Scope), or by banks for internal purposes to ensure that they meet prudential ratios and by credit insurers (e.g. Euler Hermes, Ellisphere). As we shall see in Chapter 20, this assessment leads to the award of a rating reflecting an opinion about the risk of a borrowing. The financial risk derives both from:

the borrower's ability to honour the stipulated payments; and

the specific characteristics of the borrowing, notably its guarantees and legal characteristics.

The rating is awarded at the end of a fairly lengthy process. Rating agencies assess the company's strategic risks by analysing its market position within the sector (market share, industrial efficiency, size, quality of management, etc.) and by conducting an analysis of the financials. That is to say, by conducting a financial analysis as we have presented it.

The main aspects considered include trends in the operating margin, trends and sustainability of return on capital employed, analysis of capital structure (and notably coverage of financial expense by operating profit and coverage of net debt by cash generated by operations or cash flow). We will deal with these ratios in more depth in Chapters 9 to 14.

ESG rating is becoming increasingly important. It can be independent, but is increasingly integrated with financial ratings by the major rating agencies.

Let us now deal with what may be described as “automated” financial analysis techniques, which we will not return to again.

Section 8.7 SCORING TECHNIQUES

1/ THE PRINCIPLES OF CREDIT SCORING

Credit scoring is an analytical technique intended to carry out a pre-emptive check-up of a company.

The basic idea is to prepare ratios from companies' accounts that are leading indicators (i.e. two or three years ahead) of potential difficulties. Once the ratios have been established, they merely have to be calculated for a given company and cross-checked against the values obtained for companies that are known to have run into problems or have failed. Comparisons are not made ratio by ratio, but globally. The ratios are combined in a function known as the Z-score, which yields a score for each company. The equation for calculating Z-scores is as follows:

$$Z = a + \sum_{i=1}^{n} \beta_i \times R_i$$

where a is a constant, R_i the ratios, β_i the relative weighting applied to ratio R_i and n the number of ratios used.

Depending on whether a given company's Z-score is close to or a long way off normative values based on a set of companies that ran into trouble, the company in question is said to have a certain probability of experiencing trouble or remaining healthy over the following two- or three-year period. Originally developed in the US during the late 1960s by Edward Altman, the family of Z-scores has been highly popular, the latest version of the Z″ equation being:

$$Z'' = 6.6X_1 + 3.26X_2 + 6.72X_3 + 1.05X_4$$

where X_1 is working capital/total assets; X_2 is retained earnings/total assets; X_3 is operating profit/total assets; X_4 is shareholders' equity/net debt.

If Z″ is less than 1.1, then the probability of corporate failure is high, and if Z″ is higher than 2.6, then the probability of corporate failure is low, the grey area being values of between 1.1 and 2.6. The Z″-score has not yet

been replaced by the Zeta score, which introduces into the equation the criteria of earnings stability, debt servicing and balance sheet liquidity.

Some private organisations or companies publish or sell their scoring analysis and results on companies: Ellisphere, Altares, Pouey International, Dun & Bradstreet, Creditsafe, etc.

Some “Fintech” startups (such as Kabbage, Faircent or OnDeck) have developed credit scoring methods to facilitate the process of granting (or not granting) loans to individuals or very small entities.

2/ BENEFITS AND DRAWBACKS OF SCORING TECHNIQUES

Scoring techniques represent an enhancement of traditional ratio analysis, which is based on the isolated use of certain ratios. With scoring techniques, the problem of the relative importance to be attached to each ratio has been solved, because each is weighted according to its ability to pick out the “bad” companies from the “good” ones.

That said, scoring techniques still have a number of drawbacks.

Some weaknesses derive from the statistical underpinnings of the scoring equation. The sample needs to be sufficiently large, the database accurate and consistent and the period considered sufficiently long to reveal trends in the behaviour of companies and to measure its impact.

The scoring equation has to be based on historical data from the fairly recent past and thus needs to be updated over time. Can the same equation be used several years later when the economic and financial environment in which companies operate may have changed considerably? It is thus vital for scoring equations **to be kept up to date**.

The design of scoring equations is heavily influenced by their designers' top priority, i.e. to measure the risk of failure for small and medium-sized enterprises. They are not well suited for any other purpose (e.g. predicting in advance which companies will be highly profitable) or for measuring the risk of failure for large groups. Scoring equations should thus be used only for companies where the business activities and size are on a par with those in the original sample.

Scoring techniques, which are a straightforward and rapid way of synthesising figures, have considerable appeal. Their development may even have perverse self-fulfilling effects. Prior awareness of the risk of failure (which scoring techniques aim to provide) may lead some of the companies' business partners to adopt behaviour that hastens their demise. Suppliers may refuse to provide credit, banks may call in their loans, customers may be harder to come by because they are worried about not receiving delivery of the goods they buy or not being able to rely on after-sales service.

Section 8.8 ARTIFICIAL INTELLIGENCE APPLIED TO FINANCIAL ANALYSIS

For several decades now, attempts have been made to automate financial analysis in a more sophisticated way than via a linear equation (score method). What is now called artificial intelligence (AI) applied to financial analysis was called neural networks or expert systems a few years ago. But the use of algorithms to detect business failures comes up against the psychological barrier of potentially far-reaching decision-making occurring, given the amounts involved, without being able to understand the analysis carried out by the machine.

To our knowledge, today, AI is only used in practice for rating individuals (mainly consumer loans). It remains a research area for corporate finance.

SUMMARY

The summary of this chapter can be downloaded from www.vernimmen.com.

The aim of financial analysis is to explain how a company can create value in the medium term (shareholders' viewpoint) or to determine whether it is solvent (lenders' standpoint). Either way, the techniques applied in financial analysis are the same.

First of all, financial analysis involves a detailed examination of the company's economics, i.e. the market in which it operates, its position within this market and the suitability of its production, distribution, human resources management systems and ESG policy to its strategy. Next, it entails a detailed analysis of the company's accounting principles to ensure that they reflect rather than distort the company's economic reality. Otherwise, there is no need to study the accounts, since they are not worth bothering with, and the company should be avoided like the plague as far as shareholders, lenders and employees are concerned.

A standard financial analysis can be broken down into four stages:

Wealth creation (sales trends, margin analysis) …

… requires investments in capital employed (fixed assets, working capital) …

… that must be financed (by internal financing, shareholders' equity or bank loans and borrowings) …

… and provide sufficient returns (return on capital employed, return on equity, leverage effect).

Only then can the analyst come to a conclusion about the solvency of the company and its ability to create value.

Analysts may use trend analysis, which uses past trends to assess the present and predict the future; comparative analysis, which uses comparisons with similar companies operating in the same sector as a point of reference; and normative analysis, which is based on financial rules of thumb.

Ratings represent an evaluation of a borrower's ability to repay its borrowings. Ratings are produced through a comprehensive financial analysis of groups, part of whose debt is traded on a market. For SMEs, the rating process has been significantly simplified by the implementation of the scoring method, used by insurers, banks for their internal analyses, and now some fintechs.

Scoring techniques are underpinned by a statistical analysis of the accounts of companies, which are compared with accounts of companies that have experienced problems, including bankruptcy in some cases. This automated process yields a probability of corporate failure.

QUESTIONS

1/Do shareholders and lenders carry out financial analysis in the same way?

2/What are the two prerequisites for financial analysis?

3/Is a market an economic sector? Why?

4/Why is there less risk on an original equipment market than on a replacement products market?

5/When a new product is launched, should the company invest in the production process or in the product itself? Why?

6/What is a standard financial analysis plan?

7/What standard ratios are applicable to all companies?

8/When is it possible to compare the EBIT margin of two companies?

9/What criticism can be directed at scoring techniques?

10/Why does the financial expense/EBITDA ratio play such a fundamental role in scoring techniques?

11/What are the strengths of a trend analysis?

12/Why start a financial analysis with a study of wealth creation?

13/Is financial analysis always doomed to be too late to be useful?

14/What is your view of the Italian proverb *traduttore, traditore* (to translate is to betray) in the context of a financial analysis?

15/Why will vertical integration be dismissed as being of little value after an analysis of the value chain?

16/What assumptions are made in a comparative financial analysis, especially on an international scale?

17/At the end of the day, what is the objective of the financial analyst?

You'll find more questions at www.vernimmen.com.

EXERCISES

1/Carry out an analysis of the frozen chicken value chain and decide which participants in the value chain are in a structurally weak position. The main participants in the chicken value chain are as follows:

Research: genetic selection of the best laying hens.

Breeding of laying hens: a laying hen lays eggs for 18 months non-stop, after which it is sold to the pet food industry.

Hatcheries: the eggs are placed in incubators stacked in batteries for an 18-day incubation period followed by a three-day hatching period, and kept at the appropriate temperature and level of humidity.

Rearing: chickens are reared for around 40 days, until they reach a weight of 1.8 kg. This function provides additional income for a couple who, thanks to computerised equipment, only need to spend two to three hours/day attending to the chickens.

Feed: produced by animal feed groups, which develop subtle blends of wheat, maize and soya or rapeseed proteins.

Slaughterhouses: 20,000 chickens are anaesthetised, decapitated, processed and frozen per hour, then exported mainly to the Middle East.

2/Guizzardi is one of the main Italian producers of synthetic raincoats. It sells two product ranges – the fashion and the classic raincoat – through supermarkets. Most of the Guizzardi workforce is paid the minimum wage.

Key figures (€m):

	N	***N* + 1**	***N* + 2**
Sales	256	326	422
Raw materials used	78	104	143
Personnel cost	102	139	190
Operating income	41	52	59
Net income	23	27	30
Shareholders' equity	119	129	152
Net bank borrowings	42	125	150

What is your view on the financial health of Guizzardi?

Would you be of the same opinion if you had carried out an analysis beforehand of the company's value chain and simulated the impact of a crisis in $N + 3$ (11% increase in labour costs due to the introduction of a shorter working week with no reduction in wages, 40% rise in cost of raw materials due to the drop in the value of the euro against the dollar and the $N + 3$ hike in the price of oil), with a 17% drop in the price of cotton in $N + 3$.

3/The table below appears on page 2 of the annual report of the Norne group.

Key financials (unaudited, in millions of $, excluding earnings per share and dividends):

	1996	**1997**	**1998**	**1999**	**2000**
Sales	13,289	20,273	31,260	40,112	100,789
Net income:					
Recurring net income	493	515	698	957	1,266
Items impacting comparability	91	−410	5	−64	−287
Total	**584**	**105**	**703**	**893**	**979**
Diluted earnings per share:					
Recurring net income	0.91	0.87	1.00	1.18	1.47
Items impacting comparability	0.17	−0.71	0.01	−0.08	−0.35
Total	**1.08**	**0.16**	**1.01**	**1.10**	**1.12**
Dividend per share	0.43	0.46	0.48	0.50	0.50
Total assets	16,137	22,552	29,350	33,381	65,503
Cash from operating activities (excluding change in working capital)	742	276	1,873	2,228	3,010
Capital expenditure	1,483	2,092	3,564	3,085	3,314
Share price at 31 Dec	22	21	29	44	83

State your views.

ANSWERS

Questions

1/*Yes, because a company that creates value (for shareholders) will be solvent (for lenders).*

2/*An understanding of the company's economics (market, competitive position, production and distribution system, staff) and the accounting principles used.*

3/*No, a market is defined by consistent behaviour of customers who buy products in order to meet similar needs.*

4/*The replacement products market is far more sensitive to general economic conditions, because when consumers already own a product, they can postpone replacing it until the economy picks up.*

5/*When a product is launched, it is better to invest in the product and the marketing thereof than in the production facilities or a process that could change in the future.*

6/*Wealth creation requires investments that must be financed and be sufficiently profitable.*

7/*None.*

8/*When the companies operate in the same sector.*

9/*To be effective, the sample must be sufficiently large and scores need to be updated regularly. Priority is to measure the risk of failure, which may have perverse self-fulfilling effects.*

10/*Because it reveals both high levels of debt (substantial financial expense) and low returns (low EBITDA).*

11/*It helps in understanding the company's strategy.*

12/*Because this is the very reason why the company exists and it cannot survive unless it is able to sell its products or services at a price higher than its costs (wealth creation).*

13/*In theory, yes, if the analyst merely studies the company's financial statements. In practice, no, if the analyst has factored in the "economics" of the company.*

14/*This saying demonstrates why it is important to take a close look at the accounting principles used by the company.*

15/*Because in a value chain, there are positions of structural weakness, where it is better to let others invest, even if it means handling them through supply contracts.*

16/*That accounting principles under which accounts are produced are roughly similar.*

17/*Analyse the past to understand the present and forecast the future.*

Exercises

A detailed Excel version of the solutions is available at www.vernimmen.com.

1/*Position of structural weakness:*

Breeding of laying hens: in times of crisis, all of the hens (which are unable to stop laying) have to be slaughtered and sold at a knock-down price to pet food manufacturers. The breeder thus loses their asset and source of income.

The hatchery and chicken rearing: no special skills or technology required.

Position of strength:

Research and animal feed: many opportunities outside the chicken segment.

The slaughterhouse: control over the whole of the chain upstream, through supply contracts and sales to the finished product.

2/*(a) Very good financial health, with a 20% return on equity in N + 2 and 12% ROCE with sales growing briskly. (b) Guizzardi is in a position of structural weakness, which is hidden by the good performance of the very volatile fashion range. It has no control over 92% of its costs (labour, oil, dollar). Its customers – supermarkets – would be reluctant to increase sales prices given that the competition (manufacturers of cotton raincoats) is not facing the same problems (drop in the price of cotton, rise in the price of oil). It is too small a business to expect any help from its suppliers (the big petrochemical groups).*

3/*Why have these figures not been audited? Are the negative items impacting comparability really non-recurring (three out of five years)? Should the presentation of the results not be improved? Why talk about cash flow from operating activities excluding changes in working capital? Change in working capital is a natural constituent of cash flow from operating activities. The share is very highly valued (adjusted P/E of 56 (74 non-adjusted)). All of the above should set alarm bells ringing. These are, in fact, the financial statements for Enron, which went bankrupt with a big bang in 2001.*

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NOTE

1 *That is, earn a rate of return higher than justified by risk. See Chapter 26.*

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Chapter 9
MARGIN ANALYSIS: STRUCTURE

If financial analysis were a puppet, company strategy would be pulling its strings

An analysis of a company's margins is the first step in any financial analysis. It is a key stage because a company that does not manage to sell its products or services for more than the corresponding production costs is clearly doomed to fail. But, as we shall see, positive margins are not sufficient on their own to create value or to escape bankruptcy.

Net income is what is left after all the revenues and charges shown on the income statement have been taken into account. Readers will not therefore be very surprised to learn that we will not spend too much time on analysing net income as such. A company's performance depends primarily on its operating performance, which explains why recurring operating profit (or EBIT) is the focus of analysts' attention. Financial and non-recurrent items are regarded as “inevitable” or “automatic” and thus less interesting, particularly when it comes to forecasting a company's future prospects.

The first step in margin analysis is to examine the accounting practices used by the company to draw up its income statement. We dealt with this subject in Chapter 8 and shall not restate it here, except to stress how important it is. Given the emphasis placed by analysts on studying operating profit, there is a big temptation for companies to present an attractive recurring operating profit by transferring operating charges to financial or non-recurring items (or a “non-current” category in IFRS).

The next stage involves a trend analysis based on an examination of the revenues and charges that determined the company's operating performance. This is useful only insofar as it sheds light on the past to help predict the future. Therefore, it is based on historical data and should cover several financial years. Naturally, this exercise is based on the assumption that the company's business activities have not altered significantly during the period under consideration.

> The main aim here is to calculate the rate of change in the main sources of revenue and the main costs, to examine their respective trends and thus to account for the relative change in the margins posted by the company over the period.

The main potential pitfall in this exercise is adopting a purely descriptive approach, without much or any analytical input, e.g. statements such as “personnel cost increased by 10%, rising from 100 to 110…”.

Margin trends are a reflection of a company's:

strategic position, which may be stronger or weaker depending on the scissors effect; and

risk profile, which may be stronger or weaker depending on the breakeven effect that we will examine in Chapter 10.

> All too often the strategic aspects are neglected, with the lion's share of the study being devoted to ratios and no assessment being made of what these figures tell us about a company's strategic position.

As we saw in Chapter 8, analysing a company's operating profit involves assessing what these figures tell us about its strategic position, which directly influences the size of its margins and its profitability:

a company lacking any strategic power will, sooner or later, post a poor, if not negative, operating performance;

a company with strategic power will be more profitable than the other companies in its business sector.

In our income statement analysis, our approach therefore needs to be far more qualitative than quantitative.

Section 9.1 HOW OPERATING PROFIT IS FORMED

By-nature format income statements (raw material purchases, personnel cost, etc.), which predominate in Continental Europe, provide a more in-depth analysis than the by-function format developed in the Anglo-Saxon tradition of accounting (cost of sales, selling and marketing costs, research and development costs, etc.). Granted, analysts only have to page through the notes to the accounts for the more detailed information they need to get to grips with. In most cases, they will be able to work back towards EBITDA[1] by using the depreciation and amortisation data that must be included in the notes or in the cash flow statement.

1/ SALES

> Sales trends are an essential factor in all financial analysis and company assessments. Companies for which business activities are expanding rapidly, stagnating, growing slowly, turning lower or depressed will encounter different problems. Sales growth forms the cornerstone for all financial analysis. Sales growth needs to be analysed in terms of volume (quantities sold), product ranges, price trends (including changes in exchange rates if relevant), and organic and external growth (i.e. acquisition-driven).

Before sales volumes can be analysed, external growth needs to be separated from the company's organic growth, so that like can be compared with like. This means analysing the company's performance (in terms of its volumes and prices) on a comparable-structure basis and then assessing additions to and withdrawals from the scope of consolidation. In practice, most groups publish **pro forma accounts** in the notes to their accounts, showing the income statements for the relevant and previous periods based on the same scope of consolidation and using the same consolidation methods.

If a company is experiencing very brisk growth, then analysts will need to look closely at the growth in operating costs and the cash needs generated by this growth.

A company experiencing a period of stagnation will have to scale down its operating costs and financial requirements. As we shall see later in this chapter, production factors do not have the same flexibility profile when sales are growing as when sales are declining.

Where a company sells a single product, volume growth can easily be calculated as the difference between the overall increase in sales and the selling price of its product. Where it sells a variety of different products or services, analysts face a trickier task. In such circumstances, they have the option of either working along the same lines by studying the company's main products or calculating an average price increase, based on which the average growth in volumes can be estimated.

An analysis of price increases provides valuable insight into the extent to which overall growth in sales is attributable to inflation. The analysis can be carried out by comparing trends in the company's prices with those in the general price index for its sector of activity. Account also needs to be taken of currency fluctuations and changes in the product mix, which may sometimes significantly affect sales, especially in consolidated accounts.

In turn, this process helps to shed light on the company's strategy, i.e.:

whether its prices have increased through efforts to sell higher-value-added products;

whether prices have been hiked owing to a lack of control on administrative overheads, which will gradually erode sales performance;

whether the company has lowered its prices in a bid to pass on efficiency gains to customers and thus to strengthen its market position;

etc.

The impact of changes in exchange rates on business activity should be compared with the exposure of costs to these same currencies. A company producing and selling in the same country will only be exposed on the

margin in contrast to an exporting company which is exposed on sales.

Key points and indicators:

The rate of growth in sales is the key indicator that needs to be analysed.

It should be broken down into volume and price trends, as well as into product and regional trends.

These different rates of growth should then be compared with those for the market at large and (general and sectoral) price indices. Currency effects should be taken into account.

The impact of changes in the scope of consolidation on sales needs to be studied.

2/ PRODUCTION

Sales represent what the company has been able to sell to its customers. Production represents what the company has produced during the year and is computed as follows:

	Production sold, i.e. sales
+	Changes in inventories of finished goods and work in progress at cost price
+	Production for own use, reflecting the work performed by the company for itself and carried at cost
=	**Production**

First and foremost, production provides a way of establishing a relationship between the materials used during a given period and the corresponding sales generated. As a result, it is particularly important where the company carries high levels of inventories or work in progress. Unfortunately, production is not entirely consistent insofar as it lumps together:

production sold (sales), shown at the selling price;

changes in inventories of finished goods and work in progress and production for own use, stated at cost price.

Consequently, production is primarily an accounting concept that depends on the methods used to value the company's inventories of finished goods and work in progress.

A faster rate of growth in production than in sales may be the result of serious problems:

overproduction, which the company will have to absorb in the following year thanks to market growth or conversely, by curbing its activities, bringing additional costs;

overstatement of inventories' value, which will reduce the margins posted by the company in future periods.

Production for own use does not constitute a problem unless its size seems relatively large. From a tax standpoint, it is good practice to maximise the amount of capital expenditure that can be expensed, in which case production for own use is kept to a minimum. An unusually high amount may conceal problems and an effort by management to boost book profit superficially.

Key points and indicators:

The growth rate in production and the production/sales ratio are the two key indicators.

They naturally require an analysis of production volumes and inventory valuation methods.

3/ GROSS MARGIN

Gross margin is the difference between production and the cost of raw materials used:

	Production
−	Purchase of raw materials
+	Change in inventories of raw materials
=	**Gross margin**

It is useful in industrial sectors where it is a crucial indicator and helps to shed light on a company's strategy.

This is another arena in which price and volume effects are at work, but it is almost impossible to separate them out because of the variety of items involved. At this general level, it is very hard to calculate productivity ratios for raw materials. Consequently, analysts may have to make do with a comparison between the growth rate in cost of sales and that in net sales (for by-function income statements), or the growth rate of raw materials and that in production (for by-nature income statements). A sustained difference between these figures may be attributable to changes in the products manufactured by the company or improvements (deterioration) in the production process.

Conversely, internal analysts may be able to calculate productivity ratios based on actual raw material costs used in the operating cycle, since they have access to the company's management accounts.

Key points and indicators:

How changes in the gross margin are explained between price and volume effects.

4/ GROSS TRADING PROFIT

Gross trading profit is the difference between the selling price of goods for sale and their purchase cost:

	Sale of goods
−	Purchase of goods for sale
+	Change in inventories of goods for sale
=	**Gross trading profit**

It is useful only in the retail, wholesale and trading sectors, where it is a crucial indicator and helps to shed light on a company's strategy. It is generally more stable than its components (i.e. sales and the cost of goods for sale sold), with the distributor being able to pass on price increases to the end customer and competition market dynamics imposing a price reduction when the purchase price of goods sold decreases.

5/ VALUE ADDED

This represents the value added by the company to goods and services purchased from third parties through its activities. It is equivalent to the sum of gross trading profit and gross margin used minus other goods and services purchased from third parties.

It may thus be calculated as follows for by-nature income statements:

	Gross trading profit
+	Gross margin
−	Other operating costs purchased from third parties
=	**Value added**

Other operating costs comprise outsourcing costs, property or equipment rental charges,[2] the cost of raw materials and supplies that cannot be held in inventory (i.e. water, energy, small items of equipment, maintenance-related items, administrative supplies, etc.), maintenance and repair work, insurance premiums, studies and research costs, fees payable to intermediaries and professional costs, advertising costs, transportation charges, travel costs, the cost of meetings and receptions, postal charges and bank charges (not interest on bank loans, which is booked under interest expense).

For by-function income statements, value added may be calculated as follows:

	Operating profit (EBIT)
+	Depreciation, amortisation and impairment losses on fixed assets
+	Personnel costs
+	Tax other than corporate income tax
=	**Value added**

At company level, value added is of interest only insofar as it provides valuable insight regarding the degree of a company's integration within its sector.

Besides that, we do not regard the concept of value added as being very useful. In our view, it is not very helpful to make a distinction between what a company adds to a product or service internally and what it buys in from the outside. This is because all the decisions of a company are tailored to the various markets in which it operates, such as the markets for labour, raw materials, capital goods, to cite but a few. Against this backdrop, a company formulates a specific value-creation strategy, i.e. a way of differentiating its offering from that of its rivals in order to generate a revenue stream.

This is what really matters – not the internal/external distinction.

In addition, value added is only useful where a market-based relationship exists between the company and its suppliers in the broad sense of the term, e.g. suppliers of raw materials, and suppliers of labour. In the food sector, food-processing companies usually establish special relationships with the farming industry. As a result, a company with a workforce of 1,000 may actually keep 10,000 farmers in work. This raises the issue of what such a company's real value added is.

> Value added is a useful concept only where a market-based relationship exists between a company and its suppliers.

6/ PERSONNEL COST

This is a very important item because it is often high in relative terms. Personnel expense and payroll charges also include employee incentive payments, stock options and profit-sharing.

Although personnel cost is theoretically a variable cost, it actually represents a genuinely fixed-cost item from a short-term perspective.

A financial analysis should focus both on volume and price effects (measured by the average total salary cost $\frac{\text{personnel expense}}{\text{average headcount}}$ ratio) as well as the employee productivity ratio, which is measured by the following ratios: $\frac{\text{sales}}{\text{average headcount}}$, $\frac{\text{production}}{\text{average headcount}}$ or $\frac{\text{value added}}{\text{average headcount}}$. Since external analysts are unable to make more accurate calculations, they have to make a rough approximation of the actual situation. In general, productivity gains are limited and are thinly spread across most income statement items, making them hard to isolate.

Analysts should not neglect the inertia of personnel cost, as regards either increases or decreases in the headcount. If 100 additional staff members are hired throughout the year, this means that only 50% of their salary costs will appear in the first year, with the full amount showing up in the following period. The same applies if employees are laid off.

Key points and indicators:

Personnel cost should be analysed in terms of:

productivity – sales/average headcount, value added/average headcount and production/average headcount;

cost control – personnel cost/average headcount;

growth.

7/ EARNINGS BEFORE INTEREST, TAXES, DEPRECIATION AND AMORTISATION (EBITDA)

As we saw in Chapter 3, EBITDA (earnings before interest, taxes, depreciation and amortisation) is a key concept in the analysis of income statements. The concepts we have just examined, i.e. value added and production, have more to do with macroeconomics, whereas EBITDA firmly belongs to the field of microeconomics.

We cannot stress strongly enough the importance of EBITDA in income statement analysis.

EBITDA is the difference between all operating revenues and all operating expenses that will eventually result in a cash inflow or outflow. It is computed as follows:

	Operating profit (EBIT)
+	Depreciation, amortisation and impairment losses on fixed assets
=	**EBITDA**

Alternatively, for by-nature income statements, EBITDA can be computed as follows:

	Value added
−	Taxes other than on income
−	Personnel cost and payroll charges
−	Impairment losses (net of reversals) on current assets and additions to provisions
+	Other operating revenues
−	Other operating costs
=	**EBITDA**

Other operating costs comprise redundancy payments, recurring restructuring charges, payments relating to patents, licences, concessions, representation agreements and directors' fees. Other operating revenues include payments received in respect of patents, licences, concessions, representation agreements, directors' fees, operating subsidies received.

Impairment losses on current assets include impairment losses related to receivables (doubtful receivables), inventories, work in progress and various other receivables related to the current or previous periods. Additions to provisions primarily include provisions for retirement benefit costs (when not already included in employee salary costs), litigation, major repairs and deferred costs, statutory leave, redundancy or pre-redundancy payments, early retirement, future under-activity and relocation, provided that they relate to the company's normal business activities. In fact, these provisions represent losses for the company and should be deducted from its EBITDA.

Since it is unaffected by non-cash charges – i.e. depreciation, amortisation, impairment charges and provisions, which may leave analysts rather blindsided – trends in the EBITDA/sales ratio, known as the **EBITDA margin**, form a central part of a financial analysis. All the points we have dealt with so far in this section should enable a financial analyst to explain why a group's EBITDA margin expanded or contracted by *x* points between one period and the next. The EBITDA margin change can be attributable to an overrun on production costs, to personnel cost, to the price effect on sales or to a combination of all these factors.

Our experience tells us that competitive pressures are making it increasingly hard for companies to keep their EBITDA margin moving in the right direction!

The following table shows trends in the EBITDA margins posted by various sectors in Europe over the 2000–2022 period (2021 and 2022 are Exane BNP Paribas estimates).

Sector	2005	2010	2015	2016	2017	2018	2019	2020	2021e	2022e
Aerospace & Defence	7%	5%	7%	8%	7%	9%	8%	4%	7%	9%
Automotive	5%	7%	7%	7%	7%	7%	7%	4%	7%	8%
Beverages	19%	23%	24%	24%	25%	25%	24%	22%	23%	23%
Building Materials	12%	9%	10%	11%	11%	11%	11%	11%	12%	13%
Business Services	7%	7%	8%	8%	8%	8%	8%	7%	8%	9%
Capital Goods	5%	10%	10%	10%	10%	10%	10%	9%	10%	12%
Chemicals	12%	13%	13%	14%	14%	14%	13%	13%	14%	15%
Consumer Goods	10%	11%	11%	11%	11%	11%	11%	10%	11%	11%
Food & HPC	13%	15%	16%	16%	17%	17%	17%	17%	17%	17%
Food Retail	4%	5%	3%	3%	3%	3%	3%	3%	3%	4%
General Retail	12%	12%	9%	9%	8%	8%	8%	5%	8%	9%
IT Hardware	13%	11%	12%	8%	11%	10%	12%	15%	14%	17%

Sector	2005	2010	2015	2016	2017	2018	2019	2020	2021e	2022e
IT Services	6%	9%	9%	11%	12%	12%	13%	11%	14%	16%
Leisure & Hotels	7%	6%	8%	8%	8%	7%	7%	-2%	2%	6%
Luxury Goods	14%	19%	18%	18%	19%	21%	21%	16%	21%	22%
Media	16%	18%	18%	16%	16%	16%	15%	14%	15%	16%
Medtech & Services	7%	14%	15%	16%	16%	16%	16%	14%	16%	16%
Mining	28%	19%	6%	11%	13%	13%	12%	18%	20%	17%
Oil & Gas	14%	10%	3%	3%	7%	9%	8%	5%	7%	10%
Paper & Packaging	14%	7%	8%	10%	11%	13%	12%	11%	12%	13%
Software	28%	31%	28%	28%	25%	27%	25%	25%	22%	23%
Steel	9%	4%	3%	5%	6%	6%	2%	-3%	5%	6%
Telecom Operators	19%	17%	13%	13%	14%	13%	13%	13%	14%	15%
Transport & Infrastructure	7%	8%	8%	9%	9%	8%	8%	0%	6%	9%
Utilities	15%	13%	9%	10%	9%	10%	11%	10%	11%	11%

Source: Exane BNP Paribas

It clearly shows, among other things, the tiny but stable EBITDA margin of food retailers and the very high EBITDA margin for the telecom operators, which need heavy investment, thus requiring high margins in order to get sufficient returns.

8/ OPERATING PROFIT OR EBIT

Now we come to the operating profit (EBIT), an indicator whose stock is still at the top. Analysts usually refer to the operating profit/sales ratio as the **operating margin**, trends in which must also be explained.

Operating profit is EBITDA minus non-cash operating costs. It may thus be calculated as follows:

	EBITDA
+ −	Depreciation and amortisation
+	Write-backs of depreciation and amortisation
=	**Operating profit or EBIT**

Impairment losses on fixed assets relate to operating assets (brands, purchased goodwill, etc.) and are normally included with depreciation and amortisation by accountants. We beg to differ, as impairment losses are normally non-recurring items and as such should be excluded by the analyst from the operating profit and relegated to the bottom of the income statement. If the impairment of fixed assets were recurrent, one would legitimately have to question the relevance of the valuation of such assets.

As we saw in Chapter 3, the by-function format directly reaches operating profit without passing through EBITDA:

	Sales
−	Cost of sales
−	Selling, general and administrative costs
−	Research and development costs
+/−	Other operating income and costs
=	**Operating profit (or EBIT)**

The emphasis placed by analysts on operating performance has led many companies to attempt to boost their operating profit artificially by excluding charges that should logically be included. These charges are usually to be found on the separate “Other income and costs” line, below operating profit, and are, of course, normally negative. For instance, we have seen operating foreign exchange losses, recurring provisions environmental liabilities and anticipated losses on contracts excluded from operating profit. In other cases, capital gains on asset disposals have been included in recurring EBIT.

Other companies publish an operating profit figure and a separate EBIT figure, presented as being more significant than operating profit. Naturally, it is always higher, too.

We believe it is vital for readers to avoid preconceptions and to analyse precisely what is included and what is not included in operating profit.

The following table shows trends in the operating margin posted by various sectors over the 2000–2022 period.

The reader may notice, for example, how cyclical the mining sector is in stark contrast to the food sector.

Sector	2005	2010	2015	2016	2017	2018	2019	2020	2021e	2022e
Aerospace & Defence	10%	8%	10%	11%	10%	12%	12%	9%	11%	13%
Automotive	10%	10%	11%	11%	11%	11%	11%	9%	12%	13%
Beverages	25%	29%	30%	29%	31%	31%	31%	30%	30%	30%
Building Materials	16%	14%	14%	15%	15%	15%	16%	16%	17%	18%
Business Services	9%	10%	11%	11%	11%	11%	12%	11%	12%	13%
Capital Goods	8%	13%	12%	12%	12%	12%	13%	12%	14%	15%
Chemicals	17%	18%	18%	19%	20%	19%	19%	21%	20%	21%
Consumer Goods	14%	14%	14%	14%	15%	14%	14%	14%	15%	15%
Food & HPC	16%	18%	19%	19%	20%	21%	21%	21%	21%	21%
Food Retail	6%	7%	5%	5%	5%	6%	7%	7%	7%	7%
General Retail	15%	16%	12%	12%	11%	11%	13%	12%	14%	15%
IT Hardware	18%	13%	15%	11%	14%	13%	17%	20%	19%	22%
IT Services	8%	11%	12%	13%	14%	15%	17%	16%	18%	20%
Leisure & Hotels	11%	9%	10%	10%	10%	10%	12%	7%	10%	12%
Luxury Goods	17%	23%	23%	23%	24%	25%	30%	29%	32%	32%
Media	21%	23%	22%	20%	20%	20%	21%	20%	21%	22%
Medtech & Services	12%	18%	19%	19%	20%	20%	22%	21%	22%	23%
Mining	35%	23%	14%	19%	19%	19%	18%	26%	27%	24%

Sector	2005	2010	2015	2016	2017	2018	2019	2020	2021e	2022e
Oil & Gas	16%	16%	14%	13%	15%	15%	16%	18%	17%	19%
Paper & Packaging	25%	14%	13%	16%	16%	19%	18%	18%	19%	19%
Software	29%	33%	31%	31%	29%	31%	29%	30%	26%	28%
Steel	13%	9%	7%	9%	10%	10%	6%	2%	9%	10%
Telecom Operators	35%	32%	28%	29%	30%	30%	33%	35%	35%	36%
Transport & Infrastructure	12%	14%	14%	14%	14%	14%	16%	10%	15%	17%
Utilities	22%	20%	15%	17%	16%	18%	20%	19%	20%	20%

Source: Exane BNP Paribas

Section 9.2 HOW OPERATING PROFIT IS ALLOCATED

EBIT is divided up among the company's providers of funds: financial earnings for the lenders, net income for the shareholders and corporation tax for the government, which although it does not provide funds, creates and maintains infrastructure and a favourable environment; without forgetting non-recurrent items.

1/ NET FINANCIAL EXPENSE/INCOME

It may seem strange to talk about net financial income for an industrial or service company whose activities are not primarily geared towards generating financial income. Since finance is merely supposed to be a form of financing a company's operating assets, financial items should normally show a negative balance, and this is generally the case. That said, some companies, particularly large groups generating substantial negative working capital (like big retailers, for instance), have financial aspirations and generate net financial income, to which their financial income makes a significant contribution.

Net financial expense thus equals financial expense minus financial income. Where financial income is greater than financial expense, we naturally refer to it as net financial income.

Financial income includes:

income from securities and from loans recorded as long-term investments (fixed assets). This covers all income received from investments other than participating interests, i.e. dividends and interest on loans;

other interests and related income, i.e. income from commercial (rare!) and other loans, income from marketable securities, other financial income;

write-backs of certain provisions and charges transferred, i.e. write-backs of provisions, of impairment losses on financial items and, lastly, write-backs of financial charges transferred;

foreign exchange gains on debt;

changes in unrealised capital gains for marketable securities.

Financial expense includes:

interest and related charges;

foreign exchange losses on debt;

net expense on the disposal of marketable securities, i.e. capital losses on the disposal of marketable securities;

amortisation of bond redemption premiums;

additions to provisions for financial liabilities and charges and impairment losses on investments.

> Where a company uses sophisticated financial liabilities and treasury management techniques, we advise readers to analyse its net financial income/expense carefully.

Net financial expense is not directly related to the operating cycle, but instead reflects the size of the company's debt burden and the level of interest rates. There is no volume or price effect to be seen at this level. Chapter 12, which is devoted to the issue of how companies are financed, covers the analysis of net financial expense in much greater detail.

Profit before tax is the difference between operating profit and financial expense net of financial income.

2/ NON-RECURRING ITEMS

Depending on accounting principles, firms are allowed to include more or fewer items in the exceptional/extraordinary items line. Under IFRS rules, extraordinary and exceptional items are included in operating profit without identifying them as such. Nevertheless, the real need for such a distinction has led a

large number of companies reporting in IFRS to present a “recurring operating profit” (or similar term) before the operating profit line.

Non-recurring items should be defined on a case-by-case basis by the analyst.

> One of the main puzzles for the financial analyst is to identify whether an extraordinary or exceptional item can be described as recurrent or non-recurrent. If it is recurrent, it will occur again and again in the future. If it is not recurrent, it is simply a one-off item.

Without any doubt, extraordinary items and results from discontinued operations are non-recurrent items.

Exceptional items are much trickier to analyse. In large groups, closure of plants, provisions for restructuring, etc. tend to happen more or less every year in different divisions or countries and should consequently be treated as recurring items. In some sectors, exceptional items are an intrinsic part of the business. A car rental company renews its fleet of cars every nine months and regularly registers capital gains. Exceptional items should then be analysed as recurrent items and as such be included in the operating profit. For smaller companies, exceptional items tend to be one-off items and as such should be seen as non-recurrent items.

It makes no sense to assess the current level of non-recurring items from the perspective of the company's profitability or to predict their future trends. Analysts should limit themselves to understanding their origin and why, for example, the company needed to write down the goodwill.

3/ INCOME TAX

The corporate income tax line can be difficult to analyse owing to the effects of deferred taxation, the impact of foreign subsidiaries and tax-loss carryforwards. Analysts usually calculate the group's effective tax rate (i.e. corporate income tax divided by profit before tax), which they monitor over time to assess how well the company has managed its tax affairs. A weak tax rate must be explained. It may be due to the use of tax losses carried forward (due to past difficulties) that will be depleted one day or another. It may also be explained by aggressive tax optimisation schemes which are not risk-free, especially when countries are running high levels of debts and/or deficits and society no longer accepts such behaviour.

In the notes to the accounts, there is a useful table that explains the reconciliation between the theoretical tax rate on companies and the tax rate effectively paid by the company or the group (it is called “tax proof”).

4/ GOODWILL IMPAIRMENT, INCOME FROM ASSOCIATES, MINORITY INTERESTS

Regarding goodwill impairment, the main questions should be: Where does this goodwill come from and why was it depreciated?

Depending on its size, the share of net profits (losses) of associates[3] deserves special attention. Where these profits or losses account for a significant part of net income, either they should be separated out into operating, financial and non-recurring items to provide greater insight into the contribution made by the equity-accounted associates, or a separate financial analysis should be carried out of the relevant associate. As a last-resort solution they could be added to EBIT.

Minority interests[4] are always an interesting subject and beg the following questions: Where do they come from? Which subsidiaries do they relate to? Do the minority investors finance losses or do they grab a large share of the profits? An analysis of minority interests often proves to be a useful way of working out which subsidiary(ies) generate(s) the group's profits.

Section 9.3 STANDARD INCOME STATEMENTS (INDIVIDUAL AND CONSOLIDATED ACCOUNTS)

The following tables show two model income statements. The first has been adapted to the needs of non-consolidated (individual) company accounts and is based on the by-nature format. The second is based on the by-function format as it is used in the ArcelorMittal group's consolidated accounts.

BY-NATURE INCOME STATEMENT – INDIVIDUAL COMPANY ACCOUNTS

Periods	**2018**	**2019**	**2020**
NET SALES			
+ Changes in inventories of finished goods and work in progress + Production for own use			
= **PRODUCTION**			
− Raw materials used − Cost of goods for resale sold = GROSS MARGIN or GROSS TRADING PROFIT − Other purchases and external charges			
= **VALUE ADDED**			
− Personnel cost (incl. employee profit-sharing and incentives) − Taxes other than on net income + Operating subsidies − Change in operating provisions[5] + Other operating income and cost			
= **EBITDA**			
− Depreciation and amortisation			
= **EBIT (OPERATING PROFIT) (A)**			
Financial expense − Financial income − Net capital gains/(losses) on the disposal of marketable securities + Change in financial provisions			
= **NET FINANCIAL EXPENSE (B)** **(A) − (B) = PROFIT BEFORE TAX AND NON-RECURRING ITEMS**			
+/− Non-recurring items including impairment losses on fixed assets − Corporate income tax = **NET INCOME (net profit)**			

BY-FUNCTION INCOME STATEMENT – CONSOLIDATED ACCOUNTS

	2016		**2017**		**2018**		**2019**		**2020**	
	M$	**%**	**M$**	**%**	**M$**	**%**	**M$**	**%**	**M$**	**%**
NET SALES	56,791	100.0%	68,679	100.0%	76,033	100.0%	70,615	100.0%	53,270	100.0%
− Cost of sales	50,223	88.4%	60,876	88.6%	67,025	88.2%	67,058	95.0%	50,797	95.4%
= GROSS MARGIN	**6,568**	**11.6%**	**7,803**	**11.4%**	**9,008**	**11.8%**	**3,557**	**5.0%**	**2,473**	**4.6%**
− Selling and marketing costs[6]	2,202	3.9%	2,369	3.4%	2,469	3.2%	2,355	3.3%	2,022	3.8%

	2016		2017		2018		2019		2020	
	M$	**%**	**M$**	**%**	**M$**	**%**	**M$**	**%**	**M$**	**%**
− General and administrative costs[6]										
± Other operating income and expense[6]										
= RECURRING OPERATING PROFIT	**4,366**	**7.7%**	**5,434**	**7.9%**	**6,539**	**8.6%**	**1,202**	**1.7%**	**451**	**0.8%**
− Net financial expenses	2,056	3.6%	875	1.3%	2,210	2.9%	1,554	2.2%	1,190	2.2%
= CURRENT PROFIT BEFORE TAX	**2,310**	**4.1%**	**4,559**	**6.6%**	**4,329**	**5.7%**	**(352)**	**−0.5%**	**(739)**	**−1.4%**
± Income from associates	615	1.1%	448	0.7%	652	0.9%	347	0.5%	234	0.4%
± Non-recurring items	(205)	−0.4%	−	0.0%		0.0%	(1,927)	−2.7%	1,593	3.0%
− Goodwill depreciation	−	0.0%	−	0.0%		0.0%		0.0%		0.0%
− Income Tax	986	1.7%	432	0.6%	(349)	−0.5%	459	0.7%	1,666	3.1%
= Net PROFIT	1,734	3.1%	4,575	6.7%	5,330	7.0%	(2,391)	−3.4%	(578)	−1.1%
− Minority interests	(45)	−0.1%	7	0.0%	181	0.2%	63	0.1%	155	0.3%
= NET PROFIT ATTRIBUTABLE TO SHAREHOLDERS	**1,779**	**3.1%**	**4,568**	**6.7%**	**5,149**	**6.8%**	**(2,454)**	**−3.5%**	**(733)**	**−1.4%**
Employees	199,000		197,000		209,000		191,000		168,000	

Lines in blue are found only in consolidated accounts.

Section 9.4 FINANCIAL ASSESSMENT

1/ THE SCISSORS EFFECT

The scissors effect is, first and foremost, the product of a simple phenomenon.

> The scissors effect is what takes place when revenues and costs move in diverging directions. It accounts for trends in profits and margins.

If revenues are growing by 5% p.a. and certain costs are growing at a faster rate, then earnings naturally decrease. If this trend continues, then earnings will decline further each year and ultimately the company will sink into the red. This is what is known as the scissors effect.

Whether or not a scissors effect is identified matters little. What really counts is establishing the causes of the phenomenon. A scissors effect may occur for all kinds of reasons (regulatory developments, intense competition, mismanagement in a sector, etc.) **that reflect the higher or lower quality of the company's strategic position in its market**. If it has a strong position, it will be able to pass on any increase in its costs to its customers by raising its selling prices and thus gradually widening its margins.

Where it reduces profits, the scissors effect may be attributable to:

a degree of increased competition that may prevent a company from passing on sharp increases in its raw materials costs to its customers via its selling prices. For example, a synthetic textile company would find it difficult to incorporate oil price hikes in its selling prices if at the same time the cost of wool or cotton is falling;

a statutory freeze on selling prices, making it impossible to pass on the rising cost of production factors (e.g. energy prices in some countries, where governments decide on such freezes);

psychological reluctance to put up prices. For example, when you sell your product at £19.99, you may find it difficult to exceed the £20.00 threshold;

poor cost control, e.g. where a company does not have a tight grip on its cost base and may not be able to pass rising costs on in full to its selling prices. As a result, the company no longer grows, but its cost base continues to expand.

The impact of trends in the cost of production factors is especially important because these factors represent a key component of the cost price of products. In such cases, analysts have to try to estimate the likely impact of a delayed adjustment in prices. This depends primarily on how the company and its rivals behave and on their relative strength within the marketplace.

But the scissors effect may also work to the company's benefit, as shown by the last two charts in the following figure.

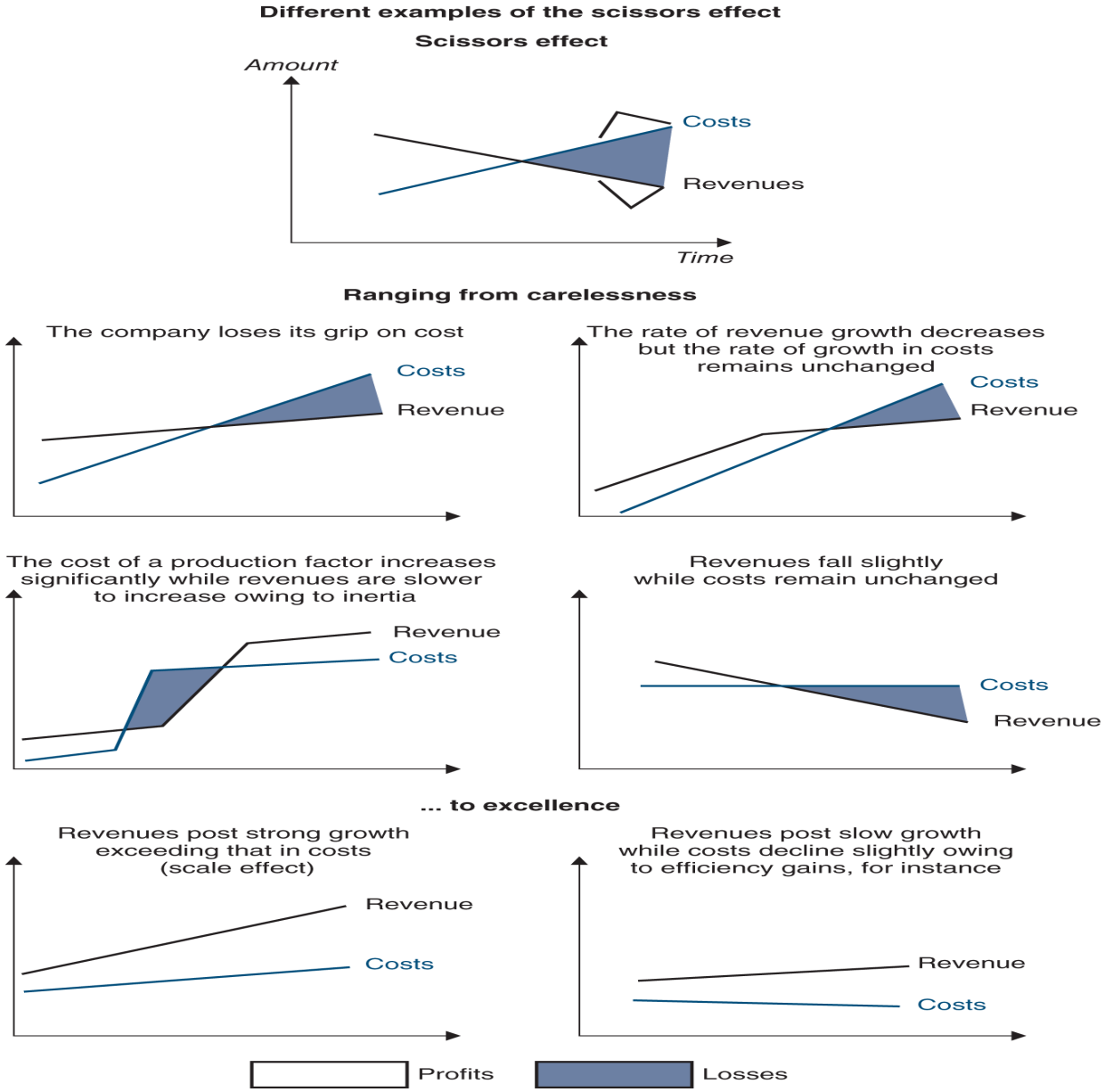
2/ PITFALLS

A company's accounts are littered with potential pitfalls, which must be sidestepped to avoid errors of interpretation during an analysis. The main types of potential traps are as follows.

(a) The stability principle (which prevents any simplistic reasoning)

This principle holds that a company's earnings are much more stable than we would expect. Net income is frequently a modest amount that remains when **charges are offset against revenues**. Net income represents an equilibrium that is not necessarily upset by external factors. Let's consider, for instance, a supermarket chain where the net income is roughly equal to the net financial income. It would be a mistake to say that if interest rates decline, then the company's earnings will be wiped out. The key issue here is whether the company will be able to slightly raise its prices to offset the impact of lower interest rates, without eroding

its competitiveness. It will probably be able to do so if all its rivals are in the same boat. But the company may be doomed to fail if more efficient distribution channels exist.



The situation is very similar for champagne houses. A poor harvest drives up the cost of grapes and pushes up the selling price of champagne. Here the key issues are when prices should be increased in view of the competition from sparkling wines, the likely emergence of an alternative product at some point in the future and consumers' ability to make do without champagne if it is too expensive.

It is important not to repeat the common mistake of establishing a direct link between two parameters and explaining one by trends in the other.

> A company's margins also depend to a great extent on those of its rivals. The purpose of financial analysis is to understand why they are above or below those of its rivals.

That said, there are limits to the stability principle.

(b) Regulatory changes

These are controls imposed on a company by an authority (usually the government) that generally restricts the “natural” direction in which the company is moving. Examples include an aggressive devaluation, the introduction of a shorter working week or measures to reduce the opening hours of shops.

(c) External factors

Like regulatory changes, these are imposed on the company. That said, they are more common and are specific to the company's sector of activity, e.g. pressures in a market, arrival (or sudden reawakening) of a very powerful competitor or changes to a collective bargaining agreement.

(d) Pre-emptive action

Pre-emptive action is where a company immediately reflects expectations of an increase in the cost of a production factor by charging higher selling prices. This occurs in the champagne sector where the build-up of pressure in the raw materials market following a poor grape harvest very soon leads to an increase in prices per bottle. Such action is taken even though it will be another two or three years before the champagne comes onto the marketplace.

> Pre-emptive action is particularly rapid where no alternative products exist in the short to medium term and competition in the sector is not very intense. It leads to gains or losses on inventories that can be established by valuing them only at their replacement cost.

(e) Inertia effects

Inertia effects are much more common than those we have just described, and they work in the opposite direction. Owing to inertia, a company may struggle to pass on fluctuations in the cost of its production factors by upping its selling prices. For instance, in a sector that is as competitive and has such low barriers to entry as the road haulage business, there is usually a delay before an increase in diesel fuel prices is passed on to customers in the form of higher shipping charges.

(f) Inflation effects

Inflation distorts company earnings because it acts as an incentive for overinvestment and overproduction, particularly when it is high (e.g. during the 1970s and the early 1980s). A company that plans to expand the capacity of a plant four years in the future should decide to build it immediately; it will then save 30–40% of its cost in nominal terms, giving it a competitive advantage in terms of accounting costs. Building up excess inventories is another temptation in high-inflation environments because time increases the value of inventories, thereby offsetting the financial expense involved in carrying them and giving rise to inflation gains in the accounts.

Inflation gives rise to a whole series of similar temptations for artificial gains, and any players opting for a more cautious approach during such periods of madness may find themselves steamrollered out of existence. By refusing to build up their inventories to an excessively high level and missing out on inflation gains, they are unable to pass on a portion of them to consumers, as their competitors do. Consequently, during periods of inflation:

depreciation and amortisation are in most cases insufficient to cover the replacement cost of an investment, the price of which has risen;

inventories yield especially large nominal inflation gains where they are slow moving.

Deflation leads to the opposite results.

(g) Capital expenditure and restructuring

It is fairly common for major investments (e.g. the construction of a new plant) to depress operating performance and even lead to operating losses during the first few years after they enter service.

For instance, the construction of a new plant generally leads to:

additional general and administrative costs such as R&D and launch costs, professional fees, etc.;

financial costs that are not matched by any corresponding operating revenue until the investment comes on stream (this is a common phenomenon in the hotel sector given the length of the payback periods on investments). In certain cases, they may be capitalised and added to the cost of fixed assets but this is even more dangerous;

additional personnel cost deriving from the early recruitment of line staff and managers, who have to be in place by the time the new plant enters service;

lower productivity owing both to the time it takes to get the new plant and equipment running and the inexperience of staff at the new production facilities.

As a result of these factors, some of the investment spending finds its way onto the income statement, which is thus weighed down considerably by the implications of the investment programme.

Conversely, a company may deliberately decide to pursue a policy of underinvestment to enhance its bottom line (so they can be sold at an inflated price) and to maximise the profitability of investments it carried out some time ago. But this type of strategy of maximising margins jeopardises its scope for value creation in the future (it will not create any new product, it will not train sufficient staff to prepare for changes in its business, etc.).

Section 9.5 CASE STUDY: ARCELORMITTAL

Volumes sold by ArcelorMittal were stable from 2016 to 2019 (at 84.6 Mt) but sales varied much more due to variations in the price of steel, and to a lesser extent to the change in scope. This is typical of an industry with high fixed costs in which the slightest imbalance between demand and supply generates major price variations: –10% in 2016, +19% and +13% in 2017 and 2018, –8% in 2019. In 2020 the volumes are down by 18% to 69.1 Mt. This decrease is explained for the most part by the Covid-19 crisis in the first half of 2020, but also for 2.4% by the disposals made by the group. Sales fell by 25%, with prices continuing to fall by 8% in a context of overproduction compared to demand.

The year 2016 marked a turning point compared to the early 2000s with a drop in Chinese steel exports, which was sharply accentuated in 2017, 2018 and then 2019 (62 Mt), under the effect of major capacity reductions, a revival of Chinese domestic demand and the implementation of anti-dumping customs taxes in Europe and the United States. In 2020, the market was totally destabilized by the Covid-19 crisis and the fall in demand.

From 2016 to 2018, ArcelorMittal benefited from a positive scissor effect, the result of the major restructuring undertaken in that year (17% reduction in personnel costs), the evolution of steel sales prices, and its partial integration upstream, which partly protected it from increases in the price of iron ore and coking coal. The operating margin, which was zero in 2015, therefore recovered to 8.6% in 2018.

However, it falls back to 1.7% in 2019 due to a once again negative scissor effect with a stable cost of sales and a 7% decline in sales. The 2019 operating margin is double that of 2015 for identical sales volumes, which shows the productivity gains made. In 2020, ArcelorMittal will save the day by maintaining a marginally positive operating result thanks to drastic cost-cutting measures.

SUMMARY

The summary of this chapter can be downloaded from www.vernimmen.com.

The first step in any financial analysis is to analyse a company's margins. This is absolutely vital because a company that fails to sell its products or services to its customers above their cost is doomed.

An analysis of margins and their level relative to those of a company's competitors reveals a good deal about the strength of a company's strategic position in its sector.

Operating profit, which reflects the profits generated by the operating cycle, is a central figure in income statement analysis. First of all, we look at how the figure is formed based on the following factors:

sales, which are broken down to show the rate of growth in volumes and prices, with trends being compared with growth rates in the market or the sector;

production, which leads to an examination of the level of unsold products and the accounting method used to value inventories, with overproduction possibly heralding a serious crisis;

raw materials used and other external charges, which need to be broken down into their main components (raw materials, transportation, distribution costs, advertising, etc.) and analysed in terms of their quantities and costs;

personnel cost, which can be used to assess the workforce's productivity (sales/average headcount, value-added/average headcount) and the company's grip on costs (personnel cost/average headcount);

depreciation and amortisation, which reflect the company's investment policy.

Further down the income statement, operating profit is allocated as follows:

net financial expense, which reflects the company's financial policy. Heavy financial expense is not sufficient to account for a company's problems, it merely indicates that its profitability is not sufficient to cover the risks it has taken;

non-recurring items (extraordinary items, some exceptional items and results from discontinued operations) and the items specific to consolidated accounts (income or losses from associates, minority interests, impairment losses on fixed assets);

corporate income tax.

Diverging trends in revenues and charges produce a scissors effect, which may be attributable to changes in the market in which the company operates, e.g. economic rents, monopolies, regulatory changes, pre-emptive action, inertia. Identifying the cause of the scissors effect provides valuable insight into the economic forces at work and the strength of the company's strategic position in its sector. We are able to understand why the company generates a profit, and get clues about its future prospects.

QUESTIONS

1/If you had to analyse the non-consolidated accounts of a holding company of several industrial participations, which profit level would you focus on? What are the important items on the income statement? Are the consolidated accounts of this holding company interesting?

2/The industrial group HEEMS shows a net result, 80% of which is from extraordinary income. State your views.

3/The industrial group VAN DAM shows a net result, 80% of which is from its financial income. State your views.

4/Why can a direct link not be drawn between an increase in production costs and the corresponding drop in profits?

5/What steps can be taken to help offset the impact of a negative scissors effect?

6/Of the following companies, which would you define as making “a margin between the end market and an upstream market”?

temporary employment agency;

storage company (warehouse);

slaughterhouse;

furniture manufacturer;

supermarket.

7/What does the stability of a company's net profits depend on?

8/Van Poucke NV has positive EBITDA and growth, but negative operating profit. State your views.

9/What is your view of a company which has seen a huge increase in sales due to a significant drop in prices and a strong volume effect?

10/Why analyse minority interests on the consolidated income statement?

11/Why break down contributions made by associate companies into operating, financial and non-recurring items?

12/In a growing company, would you expect margins to grow or to decrease?

You'll find more questions at www.vernimmen.com.

EXERCISES

1/Identify the sector to which each of the following types of company belongs: electricity producer, supermarket, temporary employment agency, specialised retailer, construction and public infrastructure.

Company	1	2	3	4	5
Sales	100	100	100	100	100
Production	100	100	104	99	0
Trading profit	23.0	24.8	0	0	0
Raw materials used	0	0	} 46.6	23.6	0
Other external charges	7.8	7.0		46.9	14.1
Personnel cost	9.3	11.7	21.5	24.1	88.2
EBITDA	6.8	6.7	28.1	3.7	4.6
Depreciation and amortisation	2.6	0.9	14.4	1.2	0.7
Operating income	4.2	5.8	7.1	2.9	3.1

2/Identify the sector to which each of the following types of company belongs: cement, luxury products, travel agency, stationery, telecom equipment.

Company	1	2	3	4	5
Sales	100	100	100	100	100
Cost of sales	35.9	84.0	67.7	44.3	52.2
Marketing and selling costs	37.0	4.4	14.0	23.1	21.8
Administrative costs	11.1	10.0	6.6	10.7	9.3
R&D costs	0	0	20.1	6.6	2.1
Operating income	16.0	1.6	−8.3	15.3	14.6

ANSWERS

Questions

1/*Focus on the financial result. Administrative costs, corporate income tax. No, as consolidated accounts will only reflect the cumulated financial situation of very diverse activities.*

2/*It is important to understand the nature of this extraordinary income as, by definition, it is not likely to be recurring.*

3/*It is important to understand the nature of this financial income: is it due to excess cash or to withdrawal of provisions?*

4/*Because of the very complex issues at work, which will require further study.*

5/*Be flexible: outsource, bring in temporary staff.*

6/*Temporary employment agency: margin between the direct employment market and the temporary employment market. Warehouse: fixed costs, although margins are linked to volumes of business. Slaughterhouses: margin between downstream and upstream. Manufacturer of furniture: margin between raw material, the wood and the sales price. Supermarkets: fixed costs, although margins are linked to volumes of business.*

7/*On the cyclical nature of sales, the flexibility of the company (fixed/variable cost split) and the margin in absolute value.*

8/*Analyse the investments and amortisation policy, along with impairment losses on fixed assets.*

9/*What is the impact on EBITDA?*

10/*In order to find out which of the group's entities is making profits.*

11/*To obtain a clearer view of the entirety of the income statement, especially operating income.*

12/*Margins should increase in theory as the company should enjoy a scale effect. It is often the reverse as, in growing markets, gain of market share is made at the expense of margins by cutting prices.*

Exercises

1/*Electricity production: 3 (large amount booked under depreciation and amortisation); supermarkets: 1 (lowest trading profits, it is a low margins business); temporary employment agency: 5 (high personnel cost); specialised retail: 2 (highest trading profits); building and public infrastructure: 4 (high outsourcing costs).*

2/*Luxury products group: 1 (high operating income margin and high marketing costs); travel agency: 2 (very low operating income, very high cost of sales, no R&D); telecom equipment supplier: 3 (high R&D costs); stationery products group: 4 (high marketing costs but lower than for the luxury products group); cement group: 5 (the last one! Limited R&D).*

NOTES

1 *Earnings before interest, taxes, depreciation and amortisation.*

2 *In IFRS accounts, rents are broken down into financial costs and depreciation. See Section 7.12.*

3 *For more on associates, see Section 6.1, 1/.*

4 *For more on minority interest, see Section 6.1, 2/.*

5 *Impairment losses on current assets operating and provisions.*

6 *ArcelorMittal does not distinguish between these items in its accounts.*

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Chapter 10
MARGIN ANALYSIS: RISKS

Costs are not like problems, people do not like them to be fixed

In Chapter 9, we compared the respective growth rates of revenues and costs. In this chapter, we will compare all company costs and key profit indicators as a percentage of sales (or production for companies that experience major swings in their inventories of finished goods and work in progress).

The purpose of this analysis is to avoid extrapolating into the future the rate of earnings growth recorded in the past. Just because profits grew by 30% p.a. for two years as a result of a number of factors does not mean they will necessarily keep growing at the same pace going forward.

Earnings and sales may not grow at the same pace owing to the following factors:

structural changes in production;

the scissors effect (see Chapter 9);

simply a cyclical effect accentuated by the company's cost structure. This is what we will be examining in more detail in this chapter.

Section 10.1 HOW OPERATING LEVERAGE WORKS

Operating leverage links variation in activity (measured by sales) with changes in result (either operating profit or net income). Operating leverage depends on the level and nature of the breakeven point.

1/ DEFINITION

Breakeven is the level of activity at which total revenue covers total costs. With business running at this level, earnings are thus zero.

Put another way:

if the company does not reach breakeven (i.e. insufficient sales), the company posts losses;

if sales are exactly equal to the breakeven point, profits are zero;

if the company exceeds its breakeven point, it generates a profit.

> A company's breakeven point depends on its cost structure.

2/ CALCULATING THE BREAKEVEN POINT

Before the breakeven point can be calculated, it is vital for costs to be divided up into fixed and variable costs. This classification depends on the period under consideration. For instance, it is legitimate to say that:

in the long term, all costs are variable, irrespective of their nature. If a company is unable to adjust its cost base, it is not a viable company;

in the very short term (less than three months), almost all costs are fixed, with the exception of certain direct costs (i.e. certain raw materials);

from a medium-term perspective, certain costs can be considered variable, e.g. indirect personnel cost.

The breakeven point cannot be defined in absolute terms. It depends first and foremost on the length of the period under consideration. It usually decreases as the period in question increases.

Before starting to calculate a company's breakeven point, it is wise to define which type of breakeven point is needed. This obvious step is all too commonly forgotten.

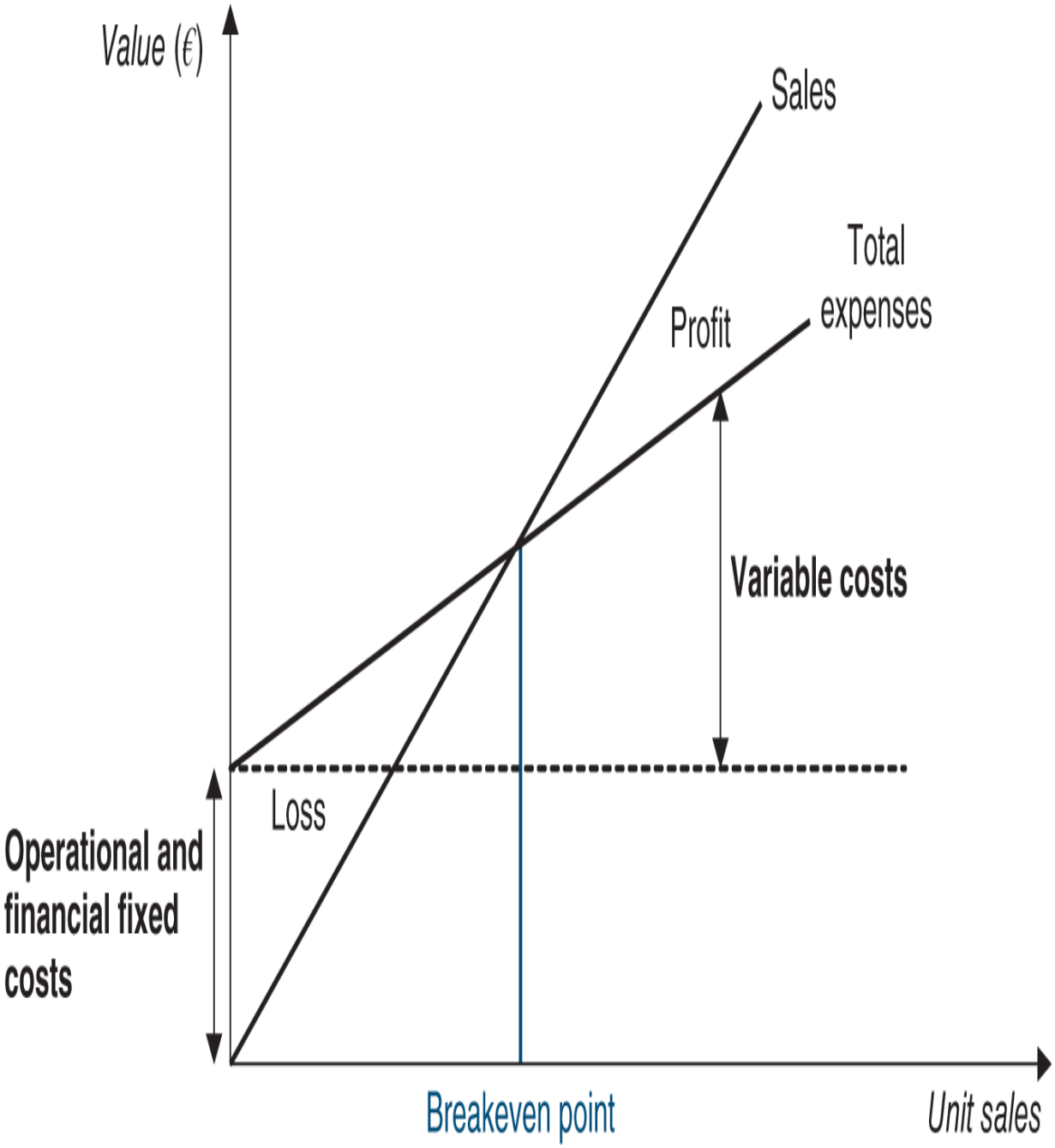
For instance, we may want to assess:

the projected change in the company's earnings in the event of a partial recession with or without a reduction in the company's output;

the sensitivity of earnings to particularly strong business levels at the end of the year;

the breakeven point implied by a strategic plan, particularly that resulting from the launch of a new business venture.

The breakeven point can be presented graphically:



The breakeven point is the level of sales at which fixed costs are equal to the contribution margin, which is defined as the difference between sales and variable costs. At the breakeven point, the following equation therefore holds true:

$$\text{Contribution margin} = \text{Fixed costs}$$

$$\text{or } m \times \text{Sales}_0 = \text{Fixed costs}$$

$$\text{i.e.Sales}_0 = \frac{\text{Fixed costs}}{m}$$

$$\text{with } m = \frac{\text{Sales} - \text{Variable costs}}{\text{Sales}}$$

where Sales_0 is the level of sales at the breakeven point and m is the contribution margin expressed as a percentage of sales.

A company has sales of €150m, fixed costs of €90m and variable costs of €50m.

Its contribution margin is thus 150 − 50 = 100, i.e. 100/150 = 66.67% when expressed as a percentage of sales.

The breakeven point thus lies at: 90/0.6667 = €135m. In this example, the company is 11.1% above its breakeven point.

In 2021, Exane BNP Paribas estimated that the typical European listed group with a revenue of €100 had €28.5 of fixed costs, €61.1 of variable costs and an operating profit of €10.4. Accordingly, a decrease of 1% in turnover results in a decrease of 3.7% in operating profit. The operating leverage measures the sensitivity of operating result to changes in sales. In this example it is 3.7% / 1% = 3.7.

$$\text{Operating leverage} = \frac{\text{Sales} - \text{Variable costs}}{\text{Sales} - \text{Variable cost} - \text{Fixed costs}}$$

$$\text{Operating leverage} = \frac{100 - 61.1}{100 - 61.1 - 28.5} = 3.7$$

The above figure rather simplifies things. In fact, fixed costs are not fixed regardless of the level of activity, they are fixed by range of activity and rise or decline in stages.

Some use the term break-even point to measure the moment in the year when a company starts to make profits. Thus, a company with a net income representing 1.1% of its sales will be deemed to start working for its shareholders only from 28 December, i.e. 4 days (1.1% × 365) before the end of the year. This is at most a colourful way of speaking, especially to people with no management skills. In fact, the sales made in the last four days of the year in our example do not constitute full profit because the company still incurs expenses. This is therefore a second abuse of language!

3/ THREE DIFFERENT BREAKEVEN POINTS

The breakeven point may be calculated before or after payments to the company's providers of funds. As a result, three different breakeven points may be calculated:

operating breakeven, which is a function of the company's fixed and variable production costs that determine the stability of operating profit[1];

financial breakeven, which takes into account the interest costs incurred by the company that determine the stability of profit before tax and non-recurring items;

total breakeven, which takes into account all the returns required by the company's lenders *and* shareholders.

Operating breakeven is a dangerous concept because it disregards any return on capital invested in the company, while financial breakeven understates the actual breakeven point because it does not reflect any return on equity, which is the basis of all value creation.

Consequently, we recommend that readers calculate the breakeven point at which the company is able to generate not a zero net income but a positive net income high enough to provide shareholders with the return they require. To this end, we need to adjust the company's cost base by the profit before tax expected by shareholders. Below this breakeven point, the company might generate an accounting profit but will not (totally) satisfy the profitability requirements of its shareholders.

Interest charges represent a fixed cost at a given level of sales (and thus capital requirement). A company that experiences significant volatility in its operating profit may thus compensate partially for this instability through

modest financial expense, i.e. by pursuing a strategy of limited debt. In any event, earnings instability is greater for a highly indebted company owing to its financial expense, which represents a fixed cost.

To illustrate these concepts in concrete terms, we have prepared the following table calculating the various breakeven points for ArcelorMittal:[2]

		2016	2017	2018	2019	2020
Sales		56,791	68,679	76,033	70,615	53,270
Operating Fixed Costs	*FC*	12,495	13,979	14,474	14,418	12,606
Financial Fixed Costs	*FiC*	1,441	427	1,558	1,207	956
Variable Costs	*VC*	39,930	49,060	54,235	54,799	40,081
Contribution margin as % of sales	$m = \frac{\text{Sales} - VC}{\text{Sales}}$	29.7%	28.6%	28.7%	22.4%	24.8%
Operating breakeven	$\text{Sales}_{op} = \frac{FC}{m}$	42,085	48,935	50,486	64,373	50,915
Position of the company relative to operating breakeven as a %	$\frac{Sales}{Sales_{op}} - 1$	35%	40%	51%	10%	5%
Financial breakeven	$Sales_f \frac{FC + FiC}{m}$	46,939	50,430	55,921	69,762	54,777
Position of the company relative to financial breakeven	$\frac{Sales}{Sales_f} - 1$	21%	36%	36%	1%	–3%
Total breakeven[3]	$Sales_t = \frac{FC + FiC + kE \times \text{book equity}/(1 - T_c)}{m}$	66,486	77,039	77,525	94,146	76,880
Position of the company relative to total breakeven	$\frac{Sales}{Sales_t} - 1$	–15%	–11%	–2%	–25%	–31%

		2016	2017	2018	2019	2020

Based on these considerations, we see that the operating leverage depends on four key parameters:

the three factors determining the stability of operating profit, i.e. the stability of sales, the structure of production costs and the company's position relative to its breakeven point;

the level of interest expense, which is itself a function of the debt policy pursued by the company.

From our experience we have seen that, in practice, a company is in an unstable position when its sales are less than 10% above its financial breakeven point. Sales 20% above the financial breakeven point reflect a relatively stable situation and sales more than 20% above the financial breakeven point for a given business structure indicate an exceptional and comfortable situation.

The 2008–2009 and the Covid-19 economic crisis have demonstrated that being 20% above the breakeven point is not enough in cyclical sectors where activity can suddenly collapse by 20%, 30% or 40% as in the cement, steel or car industries.

Section 10.2 A MORE REFINED ANALYSIS PROVIDES GREATER INSIGHT

1/ ANALYSIS OF PAST SITUATIONS

Breakeven analysis (also known as cost–volume–profit analysis) may be used for three different purposes:

to analyse earnings stability taking into account the characteristics of the market and the structure of production costs;

to assess a company's real earnings power;

to analyse the difference between forecasts and actual performance.

(a) Analysis of earnings stability

Here the level of the breakeven point in absolute terms matters much less than the company's position relative to its breakeven point.

> The closer a company is to its breakeven point, the higher its earnings instability.

When a company is close to its breakeven point, a small change in sales triggers a steep change in its net income, so a strong rate of earnings growth may simply reflect a company's proximity to its breakeven point.

Consider a company with the following manufacturing and sales characteristics:

Total fixed costs	=	€200,000
Variable costs per unit	=	€50
Unit selling price	=	€100

Its breakeven point stands at 4,000 units. To make a profit, the company therefore has to sell at least 4,000 units.

The following table shows a comparison of the relative increases (or reductions) in sales and earnings at five different sales volumes:

Sales volumes	Net income	Sensitivity

Number of units sold	Sales volumes % Increase compared to previous level (A)	% Decrease compared to previous level	Amount	Net income % Increase compared to previous level (B)	% Decrease compared to previous level	Sensitivity (B)/(A)
Number of units sold	% Increase compared to previous level (A)	% Decrease compared to previous level	Amount	% Increase compared to previous level (B)	% Decrease compared to previous level	(B)/(A)
4,000		-20%	0		-100%	
5,000	25%	16.7%	50,000	Infinite	50%	Infinite
6,000	20%	16.7%	100,000	100%	37.5%	5
7,200	20%	16.7%	160,000	60%	31%	3
8,640	20%		232,000	45%		2.25

This table clearly shows that the closer the breakeven point, the higher the sensitivity of a company's earnings to changes in sales volumes. This phenomenon holds true both above and below the breakeven point.

> We should be wary when profits are increasing much faster than sales for a company with low margins, since this phenomenon may be attributable to the operating leverage.

Consequently, breakeven analysis helps put into perspective a very strong rate of earnings growth during a good year. Rather than getting carried away with one good performance, analysts should attempt to assess the risks of subsequent downturns in reported profits.

For instance, the two spirits groups Pernod Ricard and Remy Cointreau posted similar sales trends but different earnings trends during 2020 because their proximity to breakeven point was very different. Question 8 on page 178 will ask for your comment on this table:

	Sales		Operating income	
Pernod Ricard	€8,448m	(–8.0%)	€2,260m	(–12%)
Remy Cointreau	€1,025m	(–9.0%)	€214m	(–22%)

Likewise, the sensitivity of a company's earnings to changes in sales depends, to a great extent, on its cost structure. The higher a company's fixed

costs, the greater the volatility of its earnings,

For example, in 2020, the decrease in earnings of Nestlé was similar to its turnover (–8.3% vs. –8.9% respectively). This seems consistent for an industry where costs are mainly variable.

	Sales		Operating income	
Nestlé	CHF 84.3bn	(–8.9%)	CHF14.9bn	(–8.3%)
Bureau Veritas	€4.6bn	(–9.8%)	€615m	(–26.0%)
Vinci	€43.2bn	(–10.0%)	€2.9bn	(–50.1%)

In contrast, Vinci posted a drop by 50% in operating income for a sales decrease of only 10%; this is because fixed costs are much higher for construction companies. Bureau Veritas's situation, –26% for operating income with a sales decrease of 10%, is sandwiched between the two extremes of packaged food and construction.

In the event of a jump in activity, Vinci's results will increase much faster than Nestlé's, given the importance of fixed costs for the construction company. Vinci therefore has a high level of operating leverage (or operational leverage).

(b) Assessment of normal earnings power

The operating leverage, which accelerates the pace of growth or contraction in a company's earnings triggered by changes in its sales performance, means that the significance of income statement-based margin analysis should be kept in perspective.

The reason for this is that an exceptionally high level of profits may be attributable to exceptionally good conditions that will not last. In such conditions good performance does not necessarily indicate a high level of structural profitability. This held true for a large number of steel companies in 2021.

Consequently, an assessment of a company's earnings power deriving from its structural profitability drivers needs to take into account the operating leverage and cyclical trends, i.e. are we currently in an expansion phase of the cycle?

(c) Variance analysis

Breakeven analysis helps analysts account for differences between the budgeted and actual performance of a company over a given period.

The following table helps illustrate this:

	Value in absolute terms				Structure	
	Budget	**Actual (A)**	**Change**	**% Difference**	**Theoretical cost structure (B)**	**Difference (B) − (A)**
Sales	240	180	−60	−25%	180	−
Variable costs	200	156	−44	−22%	150	−6
Contribution margin	40	24	−16	−40%	30	**−6**
Margin	16.7%	13.3%			16.7%	
Fixed costs	20	24	+4	+20%	20	**+4**
Earnings	20	0	-20	−100%	**10**	−10

This table shows the collapse in the company's earnings of 20 is attributable to:

the fall in sales (−25%);

the surge in fixed costs (+20%);

the surge in variable costs as a proportion of sales from 83.33% to 86.7%.

The **cost structure effect** accounts for 50% of the earnings decline (4 in higher fixed costs and 6 in lower contribution margin), with the **impact of sales contraction** accounting for the remaining 50% of the decline (10 lost in contribution margin: 30 against 40).

2/ STRATEGIC ANALYSIS

(a) Industrial strategy

A company's breakeven point is influenced by its industrial strategy.

A large number of companies operating in cyclical sectors made a mistake by raising their breakeven point through heavy investment. In fact, they should have been seeking to achieve the lowest possible operating leverage and, above all, the most flexible possible cost structure to curb the effects of major swings in business levels on their profitability.

For instance, integration has often turned out to be a costly mistake in the construction sector. Only companies that have maintained a lean cost structure through a strategy of outsourcing have been able to survive the successive cycles of boom and bust in the sector.

In highly capital-intensive sectors and those with high fixed costs (pulp, metal tubing, cement, etc.), it is in companies' interests to use equity financing. Such financing does not accentuate the impact of ups and downs in their sales on their bottom line through the leverage effect of debt, but in fact attenuates their impact on earnings.

A breakeven analysis provides a link between financial and industrial strategy.

When a company finds itself in a tight spot, its best financial strategy is to reduce its financial breakeven point by raising fresh equity rather than debt capital, since the latter actually increases its breakeven point, as we have seen. As an example of this policy, ArcelorMittal raised equity in May 2020.

If the outlook for its market points to strong sales growth in the long term, a company may decide to pick up the gauntlet and invest. In doing so, it raises its breakeven point, while retaining substantial room for manoeuvre. It may thus decide to take on additional debt.

As we shall see in Chapter 35, the only real difference in terms of cost between debt and equity financing can be analysed in terms of a company's breakeven point.

(b) Restructuring

When a company falls below its breakeven point, it sinks into the red. It can return to the black only by increasing its sales, lowering its breakeven point or boosting its margins.

Increasing its sales is only a possibility if the company has real strategic clout in its marketplace. Otherwise, it is merely delaying the inevitable: sales will grow at the expense of the company's profitability, thereby creating an illusion of improvement for a while but inevitably precipitating cash problems.

Lowering the breakeven point entails restructuring industrial and commercial operations, e.g. modernisation, reductions in production capacity, cuts in overheads. The danger with this approach is that management may fall into the trap of believing that it is only reducing the company's breakeven point when actually it is shrinking its business. In many cases, **a vicious circle sets in, as the measures taken to lower breakeven trigger a major business contraction, compelling the company to lower its breakeven point further, thereby sparking another business contraction, and so on. See Blackberry or Yahoo as examples.**

(c) Analysis of cyclical risks

As we stated earlier, there is no such thing as an absolute breakeven point – there are as many breakeven points as there are periods of analysis. But first and foremost, the breakeven point is a dynamic rather than static concept. If sales fall by 5%, the mathematical formulas will suggest that earnings may decline by 20%, 30% or more, depending on the exact circumstances. In fact, experience shows that earnings usually fall much further than breakeven analysis predicts.

A contraction in market volumes is often accompanied by a price war, leading to a decline in the contribution margin. In this situation, fixed costs may increase as customers are slower to pay; inventories build up leading to higher interest costs and higher operating provisions. All these factors may trigger a larger reduction in earnings than that implied by the mathematical formulae of breakeven analysis.

During cyclical downturns, contribution margins tend to decline, while fixed costs are often higher than expected.

Consequently, breakeven point increases while sales decline, as many recent examples show. Any serious forecasting thus requires modelling based on a thorough analysis of the situation. There are a number of examples of this (Toys “R” Us, JCPenney, etc.).

Businesses such as shipping and sugar production, which require substantial production capacity that takes time to set up, periodically experience production gluts or shortages. As readers are aware, if supply is inflexible, a volume glut (or shortage) of just 5% may be sufficient to trigger far larger price reductions (or hikes) (i.e. 30%, 50% and sometimes even more). Europeans witnessed this in 2018, where sugar production capacity increased following the elimination of quotas.

Here again, an analysis of competition (its strength, patterns and financial structure) is a key factor when assessing the scale of a crisis.

Section 10.3 FROM ANALYSIS TO FORECASTING: THE CONCEPT OF NORMATIVE MARGIN

A great deal of the analysis of financial statements for past periods is carried out for the purpose of preparing financial projections. These forecasts are based on the company's past and the decisions taken by management. This section contains some advice about how best to go about this type of exercise.

All too often, it is not sufficient to merely set up a spreadsheet, click on the main income statement items determining EBITDA (or operating profit if depreciation and amortisation are also to be forecast) and then grow all of these items at a fixed rate. This may be reasonable in itself, but implies unreasonable assumptions when applied systematically. Trees do not grow to the sky!

Instead, readers should:

gain a full understanding of the company and especially the key drivers impacting margins;

build growth scenarios, as well as possible reactions by the competition, the environment, international economic conditions, etc.;

draw up projections and analyse the coherence of the company's economic and strategic policy. For example, is its investment sufficient?

To this end, financial analysts have developed the concept of normalised earnings, i.e. a given company in a given sector should achieve an operating margin of *x*%.

This type of approach is entirely consistent with financial theory, which states that in each sector profitability should be commensurate with the sector's risks and that, sooner or later, these margins will be achieved, even though adjustments may take considerable time (i.e. five years or even more, in any case much longer than they do in the financial markets).

What factors influence the size of these margins? This question can be answered only in qualitative terms and by performing an analysis of the

strategic strengths and weaknesses of a company, which are all related to the concept of barriers to entry:

the degree of maturity of the business;

the strength of competition and quality of other market players;

the importance of commercial factors, such as market share, brands, distribution networks, etc.

the type of industrial process and incremental productivity gains.

This approach is helpful because it takes into consideration the economic underpinnings of margins. Its drawback lies in the fact that analysts may be tempted to overlook the company's actual margin and concentrate more on idealised future theoretical margins.

We cannot overemphasise the importance of explicitly stating and verifying the significance of all forecasts.

Section 10.4 CASE STUDY: ARCELORMITTAL4

The information[4] published by ArcelorMittal does not allow the external analyst to break down costs precisely into fixed and variable costs, despite the breakdown given in the appendix to the accounts of the cost of sales item (which accounts for between 88% and 95% of revenues). We have therefore assumed in the table on page 170 that raw material consumption (about 65% of cost of sales), logistics costs and other costs are variable, which does not seem shocking for a processing company. Other expenses were considered fixed (production personnel, administrative and commercial costs, depreciation).

According to our estimates, ArcelorMittal managed to reduce its fixed costs in parallel with the decrease in its turnover until 2016 (–35% for the former and –33% for the latter), which is an excellent industrial performance. The group was getting dangerously close to its operating breakeven point in 2015 (only 4% above) due to an erosion of its contribution margin that went from 25% to 24% over the period between 2012 and 2015. But in 2016, the group launched a major cost reduction programme over three years. As a result, its contribution margin climbed back to 29/30% in 2016–2018, before falling back to 22% in 2019 and 25% in 2020. It is true that the economic context was initially also more favourable with an increase in steel prices in Europe and the United States, thanks to the implementation of customs barriers against Chinese dumping and the reduction of Chinese exports, before deteriorating again with the Covid-19 crisis.

In 2020 ArcelorMittal remains above its operating breakeven point (+5%). The group is, however, below its financial breakeven point and does not cover the profitability requirement of its shareholders (the group is loss making).

SUMMARY

The summary of this chapter can be downloaded from www.vernimmen.com.

The breakeven point is the level of business activity, measured in terms of sales, production or the quantity of goods sold, at which total revenues cover total costs. At this level of sales, a company makes zero profit.

The breakeven point is not an absolute level – it depends on the length of period being considered because the distinction between fixed and variable costs can be justified only by a set of assumptions and, sooner or later, any fixed cost can be made variable.

Three different breakeven points may be calculated:

operating breakeven, which is a function of the company's fixed and variable production costs. It determines the stability of operating activities, but may lead to financing costs being overlooked;

financial breakeven, which takes into account the interest expense incurred by the company, but not its cost of equity;

total breakeven, which takes into account both interest expense and the net profit required by shareholders. As a result, it takes into account all the returns required by all of the company's providers of funds.

Operating breakeven is calculated by dividing a company's fixed costs by its contribution margin ((sales – variable costs) / sales). Financial breakeven is calculated by adding interest expense to the fixed costs in the previous formula. Total breakeven is computed by adding the net income required to cover the cost of equity to fixed operating costs and interest costs.

The calculation and a static analysis of a company's breakeven point can be used to assess the stability of its earnings, its normal earnings power and the actual importance of the differences between budgeted and actual performance. The further away a company lies from its breakeven point, the more stable its earnings and the more significant its earnings trends are. The higher its fixed costs as a share of total costs, the higher the breakeven point and the greater the operating leverage and the volatility of its earnings are.

An analysis of trends in the operating leverage over time reveals a good deal about the company's industrial strategy. An attempt to harness economies of scale will raise the breakeven point and thus make a company more sensitive to economic trends. Efforts to make its industrial base more flexible will lower its breakeven point, but may also reduce its potential earnings power.

QUESTIONS

1/A company's net income, which was 0.2% of sales in year 1, leaps by 40% in year 2. State your views.

2/Would it be better for an oil refinery to finance its needs using equity or debt?

3/Would it be better for an Internet start-up company to finance its needs using equity or debt?

4/You are appointed financial director of a cement group which has no debts. What should you be concerned about?

5/You are appointed financial director of a cement group which has a fairly substantial amount of debts. What should you be concerned about?

6/Is personnel cost a variable or a fixed cost?

7/A major investment bank announces the best half-year results it has ever achieved. State your views.

8/On page 172, which of Pernod Ricard and Remy Cointreau is the closer to breakeven?

9/What is the operating leverage? What does it depend on? On page 172 (second table), which group has the lowest operating leverage?

10/Are bonuses a fixed or variable cost?

11/Where would ArcelorMittal be today if its fixed costs were really fixed? What does this illustrate?

You'll find more questions at www.vernimmen.com.

EXERCISES

1/Below are the income statements of four companies with the same level of sales, but with different production costs and financial structures.

	A	B	C	D
Sales	100	100	100	100
Variable costs	65	55	36	30
Fixed costs	25	29	50	55
EBITDA	10	16	14	15
Depreciation and amortisation	2	8	4	6
EBIT	8	8	10	9
Financial expense	2	6	1.5	6
Profit before tax and non-recurring items	6	2	8.5	3

For each company, calculate the breakeven point, before and after financial costs, and the company's position relative to its breakeven point.

2/Below are the income statements for the Spanish Hoyos group. The company asks you to analyse these statements and answer the following questions:

What is your opinion of the company?

Is the company moving closer towards or further away from breakeven point?

In your view, is the company in a period of heavy capital expenditures?

What choices are made with regard to cost control?

Explain the rise in financial expense.

Grupo Hoyos	**1**	**2**	**3**
Sales	82,000	92,000	97,000
Change in finished goods and in-progress inventory	500	1,400	2,800
Production	82,500	93,400	99,800
Purchases of raw materials and goods for resale	24,800	27,400	29,900
Change in inventories	−1,700	−500	−1,600
Other external charges	20,200	23,000	23,500
Taxes	1,200	1,400	1,500
Personnel cost	29,000	33,000	37,000
Depreciation and amortisation	5,200	4,900	4,800
Provisions	100	200	–
Operating charges	78,800	89,400	95,100
Operating income	3,700	4,000	4,700
Interest, dividends and other financial income	300	400	300
Interest and other finance charges	2,300	2,900	3,900
Financial income	−2,000	−2,500	−3,600
Exceptional income	−100	−100	+100
Tax	800	700	600
Net income	800	700	600

3/In January of year 0, the Swiss group Schmidheiny published the following projected figures:

	0	1	2	3
Production	70.2	106	132	161
Raw materials used	29.4	35.4	44.3	53.8
Personnel cost	22.2	29.4	36.7	41.1
Taxes	0.5	0.7	0.7	0.8
Other external services	13.7	19.8	24.6	30.5
Outsourcing	2.5	8.9	11.2	11.3
Depreciation and amortisation	1.4	2.7	3.6	5

Calculate the breakeven point for each year. The cost structure is as follows:

variable costs: raw materials used, outsourcing, 50% of other external services;

fixed costs: all other costs.

Schmidheiny is planning a capital expenditure programme which should increase its production capacity threefold. This programme, which is spread over years 0 to 1, includes the construction of four factories and the launch of new products. The income statements for years 1, 2 and 3 factor in these investments. State your views.

The company will need to raise around €30m to finance this capital expenditure programme. Financial expense before this capital expenditure programme amounts to €1.6m, and Schmidheiny is planning to finance its new requirements using debt exclusively (average interest rate: 10% before tax). What is your view of the debt policy the company intends to pursue?

ANSWERS

Questions

1/*Low profit levels mean that any improvement in the economic situation will very quickly lead to higher profits (company close to breakeven point).*

2/*A company with very cyclical activity: financing with equity.*

3/*Shareholders' equity as it has a high fixed-costs structure.*

4/*Turning a maximum of costs into variable costs, and bringing down fixed costs.*

5/*The same concerns as Question 4, and get rid of your debts!*

6/*It depends on whether the staff are permanent or temporary and on the breakdown of salaries between fixed salary and commissions/bonuses and on whether local rules allow you to fire people rapidly (as in the UK) or not (as in Germany or France).*

7/*How much of this improvement can be attributed to an improvement in the economy, and how much to structural improvements?*

8/*Remy Cointreau is closer because it is the most sensitive to a given variation in turnover. For the same variation in turnover (–9%), Remy Cointreau's operating income decline (–22%) is much higher than that of Pernod Ricard (–12%). Another way to express this is to note that Remy Cointreau's operating margin (24%) is less than the one of Pernod Ricard (28%).*

9/*Operating leverage indicates the sensitivity of profits to a change in sales. The more variable costs are, the lower the operating leverage will be. In the table, Inditex has the lowest operating leverage.*

10/*Variable costs, but they become a source of scandal when they become fixed costs.*

11/*It would be bankrupt as it would not have been able to sustain €7bn of supplementary costs and an operating loss amounting to 11% of its sales in 2015. Fixed costs are never fixed forever. They are only fixed for a certain range of sales volume.*

Exercises

1/*A detailed Excel version of the solutions is available at www.vernimmen.com.*

	A	B	C	D
Sales	100	100	100	100
Contribution	35	45	64	70
Contribution in % of sales	35%	45%	64%	7%
Breakeven point before financial expense*	77	82	84	87
Sales/breakeven	129.6%	121.6%	118.5%	114.8%
Breakeven point after financial expense	83	96	87	96
Sales/breakeven	120.7%	104.7%	115.3%	104.5%

*Total fixed costs = fixed operating costs + depreciation and amortisation

Personnel cost will increasingly eat into EBITDA. Given the steep rise in financial expense, profit before tax and non-recurring items decreases in both absolute and relative value. The company is becoming less and less profitable, and accumulating more and more debts. One quarter of increased production is artificial, as it is tied up in inventories and finished products. The company is producing more but cannot shift its products.

With stable margins on purchases and an increase in other costs, the company is clearly approaching its breakeven point.

With depreciation and amortisation down in absolute value, we can conclude that the company is not overinvesting in fixed assets.

The management of Grupo Hoyos keeps tight control over raw materials, probably a reflection of a sound procurement policy. External charges are also well managed. Personnel cost, however, is out of control.

The company is not investing and the explanation for the increase in financial expense probably lies in the rise in working capital (increase in inventories).

3/

Economic breakeven point

Schmidheiny	**0**	**1**	**2**	**3**
Production	70.2	106	132	161
Variable costs	38.75	54.2	67.8	80.35
Contribution	31.45	51.8	64.2	80.65
Contribution as a % of sales	44.80%	48.87%	48.64%	50.09%
Fixed costs	30.95	42.7	53.3	62.15
Breakeven	69.08	87.38	109.59	124.07

A good investment: improvement in earnings with fixed costs rising at a slower pace than production. The company is moving further away from its breakeven point. Trebling production capacity only results in a doubling of fixed costs. Improvement in production or over-optimistic projections?

Breakeven point after financial expense with the envisaged level of debt:

	1	**2**	**3**
Breakeven point after financial expense	96.8	119.0	133.3
	1	2	3
Breakeven point after financial expense	96.8	119.0	133.3

Debt capital significantly increases breakeven point and, accordingly, the risk.

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Harvard Business School Press, Breakeven Analysis and Operating Leverage: Understanding Cash Flows, *Manager's Toolkit: The 13 Skills Managers Need to Succeed*, 2006.

NOTES

1 *A cash operating breakeven point can be computed for which EBITDA equals zero, as only cash operating expenses are taken into account.*

2 *We analyse the table for ArcelorMittal in Section 10.4 of this chapter. We have assumed that costs of sales and selling and marketing costs are all variable costs and that other operating costs are fixed. This is evidently a rough cut but nevertheless gives a reasonable estimate.*

3 *For ArcelorMittal, we have assumed a cost of equity (see Chapter 19) of 15% in 2016–2017 12% thereafter, and a tax rate between 25% and 28%.*

4 *The breakeven table for ArcelorMittal is on page 170.*

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Chapter 11
WORKING CAPITAL AND CAPITAL EXPENDITURES

Building the future

As we saw in the standard financial analysis, all value creation requires investment. In finance, investment means creating either new fixed assets or working capital. The latter, often high in Continental Europe, deserves some explanation.

Section 11.1 THE NATURE OF WORKING CAPITAL

Every analyst intuitively tries to establish a percentage relationship between a company's working capital and one or more of the measures of the volume of its business activities. In most cases, the chosen measure is annual turnover or sales.

The ratio:

$$\frac{\text{Operating working capital}}{\text{Annual sales}}$$

reflects the fact that the operating cycle generates an operating working capital that includes:

capital “frozen” in the form of inventories, representing procurement and production costs that have not yet resulted in the sale of the company's products;

funds “frozen” in customer receivables, representing sales that customers have not yet paid for;

accounts payable that the company owes to suppliers.

The balance of these three items represents the net amount of money tied up in the operating cycle of the company. In other words, if the working capital turnover ratio is 25% (which is high), this means that 25% of the company's annual sales volume is “frozen” in inventories and customer receivables not financed by supplier credit. This also means that, at any moment, the company needs to have on hand funds equal to a quarter of its annual sales to pay suppliers and employee salaries for materials and work performed on products or services that have not yet been manufactured, sold or paid for by customers.

Since the beginning of this century, the working capital of large listed European groups has had a tendency to shrink, as illustrated in the following table:

WORKING CAPITAL EXPRESSED AS A % OF SALES (EUROPEAN LISTED GROUPS)

Sector	2005	2010	2015	2016	2017	2018	2019	2020	2021e	2022e
Aerospace & Defence	−17%	−21%	−17%	−19%	−21%	−24%	−22%	−20%	−18%	−18%
Automotive	6%	2%	6%	7%	7%	8%	8%	8%	7%	7%
Beverages	12%	1%	0%	5%	−7%	−7%	−1%	−8%	−6%	−7%

Sector	2005	2010	2015	2016	2017	2018	2019	2020	2021e	2022e
Building Materials	21%	15%	17%	17%	15%	17%	17%	17%	18%	17%
Business Services	6%	2%	3%	3%	3%	3%	3%	2%	3%	3%
Capital Goods	13%	7%	10%	11%	10%	10%	9%	7%	8%	7%
Chemicals	22%	19%	18%	20%	18%	19%	17%	15%	15%	15%
Consumer Goods	24%	17%	17%	20%	16%	16%	16%	11%	12%	12%
Food & HPC	6%	3%	0%	0%	0%	3%	1%	0%	0%	0%
Food Retail	−7%	−10%	−13%	−12%	−13%	−13%	−12%	−13%	−13%	−13%
General Retail	4%	1%	1%	1%	1%	1%	1%	0%	0%	0%
IT Hardware	10%	6%	12%	14%	9%	11%	11%	12%	12%	13%
IT Services	−4%	−10%	−10%	−8%	−10%	−11%	−12%	−16%	−14%	−13%
Leisure & Hotels	−14%	−10%	−10%	−8%	−8%	−8%	−8%	−10%	−8%	−7%
Luxury Goods	16%	18%	25%	24%	21%	19%	19%	25%	22%	21%
Media	−19%	−17%	−17%	−16%	−14%	−13%	−14%	−18%	−15%	−14%
Medtech & Services	7%	9%	12%	12%	9%	9%	13%	11%	11%	11%
Mining	11%	10%	9%	9%	8%	7%	7%	9%	7%	7%
Oil & Gas	3%	3%	2%	1%	1%	0%	1%	1%	1%	1%
Paper & Packaging	24%	12%	9%	8%	7%	8%	7%	5%	6%	6%
Software	2%	−5%	−8%	−10%	−9%	−10%	−8%	−10%	−9%	−8%
Steel	16%	18%	11%	13%	13%	15%	14%	16%	15%	15%
Telecom Operators	−13%	−14%	−5%	−7%	−8%	−8%	−6%	−4%	−3%	−1%
Transport & Infrastructure	−1%	−5%	−6%	−5%	−5%	−6%	−5%	−6%	−5%	−6%

Sector	2005	2010	2015	2016	2017	2018	2019	2020	2021e	2022e
Utilities	−5%	2%	2%	2%	2%	1%	0%	1%	2%	2%

Source: Exane BNP Paribas

As we will see in Section 11.2, working capital is often expressed as a number of days of sales. This figure is derived by multiplying a percentage ratio by 365. In our example, a ratio of 25% indicates that working capital totals around 91 days of the company's sales.

1/ STEADY BUSINESS, PERMANENT WORKING CAPITAL

Calculated from the balance sheet, a company's working capital is the balance of the accounts directly related to the operating cycle. These amounts are very liquid; that is, they will either be collected or paid within a very short period of time.

No matter when the books are closed, the balance sheet always shows working capital, although the amount changes depending on the statement date. The only exceptions are the rare companies whose operating cycle actually generates cash rather than absorbs it.

> There is an apparent contradiction between the essentially liquid nature of working capital on the one hand and its permanence on the other.

Working capital is liquid in the sense that every element of it disappears in the ordinary course of business. Raw materials and inventories are consumed in the manufacturing process. Work in progress is gradually transformed into finished products. Finished products are (usually) sold. Receivables are (ordinarily) collected and become cash, bank balances, etc. Similarly, debts to suppliers become outflows of cash when they are paid.

As a result, if the production cycle is less than a year (which is usually the case), all of the components of working capital at the statement date will disappear in the course of the following year. But at the next statement date, other operating assets will have taken their place. **This is why we view working capital as a permanent requirement.**

Even if each component of working capital has a relatively short lifetime, the operating cycles are such that the contents of each are replaced by new contents. As a result, if the level of business activity is held constant, the various working capital accounts remain at a constant level.

All in all, at any given point in time, a company's working capital is indeed liquid. It represents the difference between certain current assets and certain current liabilities. But thinking in terms of “permanent working capital” introduces a radically different concept. It suggests that if business is stable, current (liquid) operating assets and current operating liabilities will be renewed and new funds will be tied up, constituting a permanent capital requirement as surely as fixed assets are a permanent capital requirement.

> Working capital is two-sided. From the point of view of balance sheet value, it is liquid. From a going-concern point of view, it is permanent.

2/ SEASONAL BUSINESS ACTIVITY, PARTLY SEASONAL REQUIREMENT

When a business is seasonal, purchases, production and sales do not take place evenly throughout the year. As a result, working capital also varies during the course of the year, expanding then contracting.

The working capital of a seasonal business never falls to zero. Whether the company sells canned vegetables or raincoats, a minimum level of inventories is always needed to carry the company over to the next production cycle.

In our experience, companies in seasonal businesses often pay too much attention to the seasonal aspect of their working capital and ignore the fact that a significant part of it is permanent. As some costs are fixed, so are some parts of the working capital.

We have observed that in some very seasonal businesses, such as toys, the peak working capital is only twice the minimum. This means that half of the working capital is permanent, the other half is seasonal.

3/ CONCLUSION: PERMANENT WORKING CAPITAL AND THE COMPANY'S ONGOING NEEDS

> An external analyst risks confusing the working capital on the balance sheet with the permanent working capital.

Approximately 30% of all companies close their books at a date other than 31 December. They choose these dates because that is when the working capital

shown on their balance sheets is lowest. This is pure window dressing. Bordeaux vineyards close on 30 September, Caribbean car rental companies on 30 April.

A company in trouble uses trade credit to the maximum possible extent. In this case, you must restate working capital by eliminating trade credit that is in excess of normal levels. Similarly, if inventory is unusually high at the end of the year because the company speculated that raw material prices would rise, then the excess over normal levels should be eliminated in the calculation of permanent working capital. Lastly, to avoid giving the impression that the company is too cash-rich, some companies make an extra effort to pay their suppliers before the end of the year. This is more akin to investing cash balances than to managing working capital.

> It may be rash to say that the working capital at fiscal year end is the company's permanent working capital.

Although the working capital on the balance sheet at year end can usually not be used as an indicator of the company's permanent requirement, its year-to-year change can still be informative. Calculated at the same date every year, there should be no seasonal impact. Analysing how the requirement has changed from year end to year end can shed light on whether the company's operations are improving or deteriorating.

> The year-end working capital is informative only if compared with the working capital at other year-end dates.

You are therefore faced with a choice:

if the company publishes quarterly financial statements, you can take the permanent working capital to be the lowest of the quarterly balances and the average working capital to be the average of the figures for each of the four quarters;

if the company publishes only year-end statements, you must reason in terms of year-to-year trends and comparisons with competitors.[1]

Section 11.2 WORKING CAPITAL TURNOVER RATIOS

As financial analysis consists of uncovering hidden realities, let's simulate reality to help us understand the analytical tools.

Working capital accounts are composed of uncollected sales, unsold production and unpaid-for purchases, in other words, the business activities that took place during the days preceding the statement date. Specifically:

if customers pay in 15 days, receivables represent the last 15 days of sales;

if the company pays suppliers in 30 days, accounts payable represent the last 30 days of purchases;

if the company stores raw materials for three weeks before consuming them in production, the inventory of raw materials represents the last three weeks of purchases.

These are the principles. Naturally, the reality is more complex, because:

payment periods can change;

business is often seasonal, so the year-end balance sheet may not be a real picture of the company;

payment terms are not the same for all suppliers or all customers;

the manufacturing process is not the same for all products.

Nevertheless, working capital turnover ratios calculated on the basis of accounting balances represent an attempt to see the reality behind the figures. But let's not delude ourselves. At the very best the external analyst will arrive at an approximate estimation of the company's payment periods rather than its actual payment periods. Nevertheless, the development of these ratios over several years will provide a reliable trend.

1/ THE MENU OF RATIOS

(a) Days' sales outstanding (DSO)

The days' sales outstanding (or days/receivables) ratio measures the average payment terms the company grants its customers (or the average actual payment period). It is calculated by dividing the receivables balance by the company's average daily sales, as follows:

$$\frac{\text{Receivables}}{\text{Annual sales (incl.VAT)}} \times 365 = \text{Days' sales outstanding}$$

As the receivables on the balance sheet are shown inclusive of VAT, for consistency, sales must be shown on the same basis. But the sales shown on the profit and loss statement are exclusive of VAT. You must therefore increase them by the applicable VAT rate for the products the company sells or by an average rate if it sells products taxed at different rates.

Receivables are calculated as follows:

	Customer receivables and related accounts
+	Outstanding bills discounted (if not already included in receivables)
−	Advances and deposits on orders being processed
=	**Total receivables**

(b) Days' payables outstanding (DPO)

The days/payables ratio measures the average payment terms granted to the company by its suppliers (or the average actual payment period). It is calculated by dividing accounts payable by average daily purchases, as follows:

$$\frac{\text{Accounts payable}}{\text{Annual purchases (incl.VAT)}} \times 365 = \text{Number of days of payables}$$

Accounts payable are calculated as follows:

	Accounts payable and related accounts
+	Advances and deposits paid on orders
=	**Total accounts payable**

To ensure consistency, purchases are valued inclusive of VAT. They are calculated as follows:

	Purchase of goods held for resale (incl. VAT)
+	Purchase of raw materials (incl. VAT)
+	Other external costs (incl. VAT)
=	**Total purchases**

The amounts shown on the profit and loss statement must be increased by the appropriate VAT rate.

When the figure for annual purchases is not available (mainly when the income statement is published in the by-function format), the days' payables ratio is approximated as:

$$\frac{\text{Accounts payable}}{\text{Sales (incl. VAT)}} \times 365 = \text{Payables in number of days of sales}$$

(c) Days' inventory outstanding (DIO)

The significance of the inventory turnover ratios depends on the quality of the available accounting information. If it is detailed enough, you can calculate true turnover ratios. If not, you will have to settle for approximations that compare dissimilar data.

You can start by calculating an overall turnover ratio, not meaningful in an absolute sense, but useful in analysing trends:

$$\frac{\text{Inventories and work in progress}}{\text{Annual sales (excl. VAT)}} \times 365 = \text{Approximate of number of days of inventory}$$

Depending on the available accounting information, you can also calculate the turnover of each component of inventory, in particular raw materials and goods held for resale, and distil the following turnover ratios:

Days of raw material, reflecting the number of days of purchases the inventory represents or, viewed the other way round, the number of days necessary for raw materials on the balance sheet to be consumed:

$$\frac{\text{Inventory of raw material}}{\text{Annual purchases of raw material (excl. VAT)}} \times 365 = \text{Number of days of purchases}$$

Days of goods held for resale, reflecting the period between the time the company purchases goods and the time it resells them:

$$\frac{\text{Inventory of goods held for resale}}{\text{Annual purchases of goods held for resale (excl. VAT)}} \times 365$$

$$= \text{Number of days of goods held for resale}$$

Days of finished goods inventory, reflecting the time it takes the company to sell the products it manufactures, and calculated with respect to cost of goods sold:

$$\frac{\text{Inventory of finished goods}}{\text{Annual cost of goods sold}} \times 365 = \text{Number of days of finished goods inventory}$$

If cost of goods sold is unavailable, it is calculated with respect to the sales price:

$$\frac{\text{Finished goods inventory}}{\text{Annual sales (excl. VAT)}} \times 365$$

Days of work in progress, reflecting the time required for work in progress and semi-finished goods to be completed – in other words, the length of the production cycle:

$$\frac{\text{(Work in progress)} + \text{(semi-finished products)}}{\text{Annual cost of goods sold}} \times 365 = \text{Length of production cycle}$$

For companies that present their profit and loss statement by nature, this last ratio can be calculated only from internal sources as cost of goods sold does not appear as such on the P&L. The calculation is therefore easier for companies that use the by-function presentation for their profit and loss statement (cost of sales).

2/ THE LIMITS OF RATIO ANALYSIS

Remember that, in calculating the foregoing ratios, you must follow two rules:

make sure the basis of comparison is the same: sales price or production cost, inclusive or exclusive of VAT;

compare outstandings in the balance sheet with their corresponding cash flows.

Turnover ratios have their limitations:

they can be completely misleading if the business of the company is seasonal. In this case, the calculated figures will be irrelevant. To take an extreme example, imagine a company that makes all of its sales in a single month. If it grants payment terms of one month, its number of days' receivables at the end of that month will be 365;

they provide no breakdown – unless more detailed information is available – of the turnover of the components of each asset (or liability) item related to the operating cycle. For example, receivables might include receivables from private-sector customers, international customers and government agencies. These three categories can have very different collection periods (government agencies, for instance, are known to pay late).

You must ask yourself what degree of precision you want to achieve in your analysis of the company. If a general idea is enough, you might be satisfied with average ratios, as calculated above, after verifying that:

the business is not too seasonal;

if it is seasonal, then the available data refer to the same point in time during the year. If this is the case, we advise you to express the ratios in terms of a percentage (receivables/sales), which does not imply a direct link with actual payment conditions.

If you need a more detailed analysis, you will have to look at the actual business volumes in the period just prior to the statement date. In this case, the daily sales figure will not be the annual sales divided by 365, but the last quarter's sales divided by 90, the last two months divided by 60, etc.

If you must perform an in-depth audit of outstandings in the balance sheet, averages are not enough. You must compare outstandings with the transactions that gave rise to them.

Section 11.3 READING BETWEEN THE LINES OF WORKING CAPITAL

Evaluating working capital is an important part of an analyst's job, which is not always made easy by financial or accounting optimisation techniques (factoring, reverse-factoring and securitisation covered in Chapter 21) that reduce working capital. The analyst will have to try to detect them in order to establish an accurate and effective representation of the initial situation.

1/ GROWTH OF THE COMPANY

In principle, the ratio of working capital to annual sales should remain stable.

If the permanent requirement equals 25% of annual sales and sales grow from €100m to €140m, the working capital requirement should grow by €10m (€40m × 25%).

Growth in business volume causes an increase in working capital. This increase appears, either implicitly or explicitly, in the cash flow statement.

> Growth in the company's business tends to increase the amount of working capital. This increase represents an additional need that a business plan must take into account.

We might be tempted to think that working capital does not grow as fast as sales because certain items, such as minimum inventory levels, are not necessarily proportional to the level of business volume. Experience shows, however, that growth very often causes a sharp, sometimes poorly controlled, increase in working capital at least proportional to the growth in the company's sales volume.

In fact, a growing company is often confronted with **working capital that grows faster than sales**, for various reasons:

management sometimes neglects to manage working capital rigorously, concentrating instead on strategy and on increasing sales;

management often tends to integrate vertically, both upstream and downstream. Consequently, structural changes to working capital are introduced as it starts growing much more rapidly than sales, as we will explain later on.

When a company is growing, the increase in working capital constitutes a real use of funds, just as surely as capital expenditures do. For this reason, increases in working capital must be analysed and projected with equal care.

Efficient companies are characterised by controlled growth in working capital. Indeed, successful expansion often depends on the following two conditions:

ensuring that the growth in working capital tracks the growth in sales rather than zooming ahead of it;

creating a corporate culture that strives to contain working capital. If working capital grows unchecked, sooner or later it will lead to serious financial difficulties and compromise the company's independence.

Today, companies faced with slower growth in business manage working capital strictly through just-in-time inventory management, greater use of outsourcing, digitalisation of customer and supplier relationship management, financial incentives for salespeople linked to customers' payments, etc. (as we will see in Chapter 49).

2/ RECESSION

By analysing the working capital of a company facing a sudden drop in its sales, we can see that it reacts in stages.

Initially, the company does not adjust its production levels. Instead, it tries other ways to shore up sales. The recession also leads to difficulty in controlling accounts receivable, because customers start having financial difficulties and stretch out their payments over time. The company's cash situation deteriorates, and it has trouble honouring its commercial obligations, so it secures (or forces, especially as year-end approaches) more favourable payment terms from its suppliers. At the end of this first phase, working capital – the balance between the various items affected by divergent forces – stabilises at a higher level. This situation was experienced in particular by car manufacturers in late 2020.

In the second phase, the company begins to adopt measures to adjust its operating cycle to its new level of sales. It cuts back on production, trims raw material inventories and ratchets customer payment terms down to normal levels. By limiting purchases, accounts payable also decline. These measures, salutary in the short term, have the paradoxical effect of inflating working capital because certain items remain stubbornly high while accounts payable decline.

As a result, the company produces (and sells) below capacity, causing unit costs to rise and the bottom line to deteriorate.

Finally, in the third phase, the company returns to a sound footing:

sales surpass production;

the cap on purchases has stabilised raw material inventories. When purchases return to their normal level, the company again benefits from a “normal” level of supplier credit.

Against this background, working capital stabilises at a low level that is once again proportional to sales, but only after a crisis that might last as long as a year.

It is important to recognise that any contraction strategy, regardless of the method chosen, requires a certain period of psychological adjustment. Management must be convinced that the company is moving from a period of expansion to a period of recession. This psychological change may take several weeks, but once it is accomplished, the company can:

decrease purchases;

adjust production to actual sales;

reduce supplier credit which the company had tried to maximise. Of course, this slows down the reduction in working capital.

We have seldom seen a company take less than nine months to significantly reduce its working capital and improve the bottom line (unless it liquidates inventories at fire-sale prices).

> During a recession, working capital has a paradoxical tendency to grow; then, despite restructuring measures, it still doesn't budge. It is only towards the end of the recession that working capital subsides and the company gains breathing space.

3/ VALUE CHAIN INTEGRATION STRATEGIES

Companies that expand vertically by acquiring suppliers or distributors lengthen their production cycle. In so doing, they increase their value added. But this very process also increases their working capital because the increased value added is incorporated in the various line items that make up working capital, notably receivables and finished goods inventories. Conversely, accounts payable reflect purchases made further upstream and therefore contain less value added. So they become proportionately lower.

4/ NEGATIVE WORKING CAPITAL

The operating cycles of companies with negative working capital are such that, thanks to a favourable timing mismatch, they collect funds prior to disbursing some payments. There are two basic scenarios:

supplier credit is much greater than inventory turnover, while at the same time customers pay quickly, in some cases in cash: food retailing, e-commerce companies, motorways, companies with very short production cycles like newspaper or bread companies, companies whose suppliers are in a position of such weakness – printers or hauliers that face stiff competition, for example – that they are forced to offer inordinately long payment terms to their customers;

customers pay in advance. This is the case for companies that work on military contracts, travel agencies, collective catering companies, companies that sell subscriptions, etc. Nevertheless, these companies are sometimes required to lock up their excess cash for as long as the customer has not yet "consumed" the corresponding service. In this case, negative working capital may offer a way of earning significant investment income (on resulting treasury placement) rather than presenting a source of funding that can be freely used by the firm to finance its operations.

A low or negative working capital is a boon to a company looking to expand without recourse to external capital. Efficient companies, in particular in mass-market retailing, all benefit from low or negative working capital. Put another way, certain companies are adept at using intercompany credit to their best advantage.

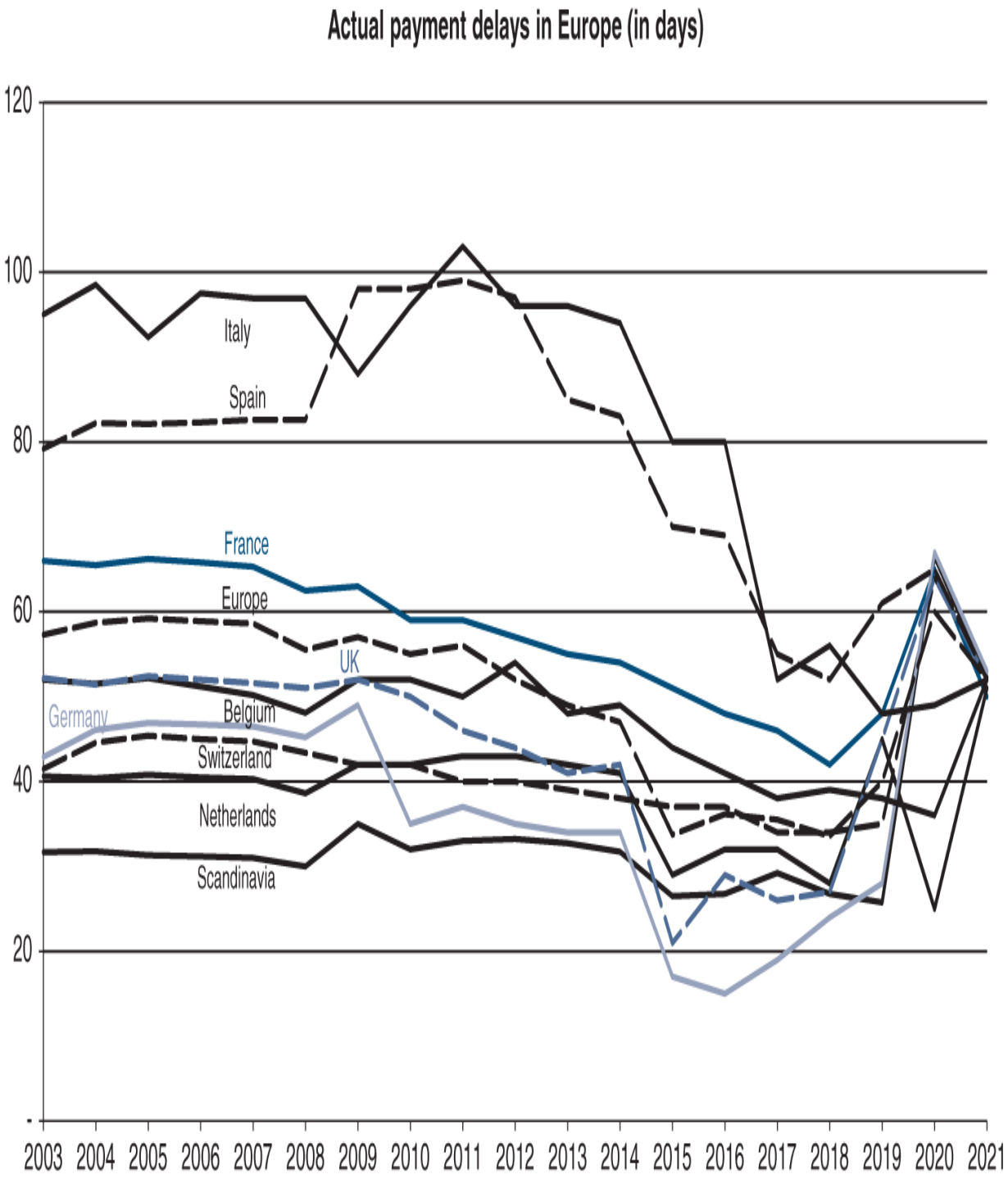
The presence of negative working capital can, however, lead to management errors. We once saw an industrial group that was loathe to sell a loss-making division because it had a negative working capital. Selling the division would have shored up the group's profitability but would also have created a serious cash management problem, because the negative working capital of the unprofitable division was financing the working capital of the profitable divisions. Short-sightedness blinded the company to everything but the cash management problem it would have had immediately after the disposal. Recurring losses were disregarded.

We have seen companies with negative working capital, losing money at the operating level, that were able to survive because of a strong growth in sales. Consequently, inflows generated by increasingly negative working capital with growth in revenues allowed them to pay for the operating deficit. The wake-up call is pretty tough when growth slows down and payment difficulties appear. Unsurprisingly, no banker is keen to lend money in this scenario.

5/ WORKING CAPITAL AS AN EXPRESSION OF BALANCE OF POWER

Economists have tried to understand the theoretical justification for intercompany credit, as represented by working capital. To begin with, they have found that there are certain minimum technical turnaround times. For example, a customer must verify that the delivery corresponds to their order and that the invoice is correct. Some time is also necessary to actually effect the payment.

But this explains only a small portion of intercompany credit, which varies greatly from one country to another:



Source: Intrum Justitia

Several factors can explain the disparity:

Cultural differences: in Germanic countries, the law stipulates that the title does not pass to the buyer until the seller is paid. This makes generous payment terms much less attractive for the buyer, because as long as the supplier is not paid, the goods delivered cannot be processed.

Historical factors: in France, Italy and Spain, bank credit was restricted for a long time. Companies whose businesses were not subject to credit restrictions (building, exports, energy, etc.) used their bank borrowing capacity to support companies subject to the restrictions by granting them generous payment terms. Tweaking payment terms was also a way of circumventing price controls in the Mediterranean countries.

Technical factors: in the USA, suppliers often offer two-part trade credit, where a substantial discount is offered for relatively early payment, such as a 2% discount for payment made within 10 days. Most buyers take this discount. This discount explains the low level of accounts payable in US groups' balance sheets. As a by-product, failure of a buyer to take this discount could serve as a very strong and early signal of financial distress.

Furthermore, Delaunay and Dietsch (1999) have shown that supplier credit acts as a financial shock absorber for companies in difficulty. For commercial reasons, suppliers feel compelled to support companies whose collateral or financial strength is insufficient (or has become insufficient) to borrow from banks. Suppliers know that they will not have complete control over payment terms. They have unwittingly become bankers and, like bankers, they attempt to limit payment terms on the basis of the back-up represented by the customer's assets and capital.

That said, it is unhealthy for companies to offer overly generous payment terms to their customers. By so doing, they run a credit risk. Even though the corporate credit manager function is more and more common, even in small companies, credit managers are not in the best position to appreciate and manage this risk. Moreover, intercompany credit is one of the causes of the domino effect in corporate bankruptcies.

In conclusion, we reiterate the fact that intercompany credit is one of the most visible manifestations of the balance of power between customers and suppliers. The size of intercompany credit serves as an indication of the strength of the company's strategic position vis-à-vis its customers and suppliers.

How else can we explain why 16 of the 41 non-financial groups in the Eurostoxx 50 in 2019 enjoyed negative working capital requirements, including Orange, Airbus, Unilever, AB InBev and Air Liquide!

The development of reverse factoring (see Section 21.3, 2/) is another (more positive) expression of the balance of power: the client, a large group, gives its smaller suppliers the benefit of its access to attractive banking terms. It is also often an opportunity to lengthen payment terms (suppliers are not very sensitive to this because they discount the debt).

Section 11.4 ANALYSING CAPITAL EXPENDITURES (CAPEX)

The following three questions should guide your analysis of the company's investments:

What is the state of the company's plant and equipment?

What is the company's capital expenditure policy?

What are the cash flows generated by these investments?

1/ ANALYSING THE COMPANY'S CURRENT PRODUCTION CAPACITY

The current state of the company's fixed assets is measured by the ratio

$$\frac{\text{Net fixed assets}^2}{\text{Gross fixed assets}}$$

A very low ratio (less than 30%) indicates that the company's plant and equipment are probably worn out. In the near term, the company will be able to generate robust margins because depreciation charges will be minimal. But don't be fooled, this situation cannot last forever. In all likelihood, the company will soon have trouble because its manufacturing costs will be higher than those of its competitors who have modernised their production facilities or innovated. Such a company will soon lose market share and its profitability will decline.

If the ratio is close to 100%, the company's fixed assets are relatively new, and it will probably be able to reduce its capital expenditure in the next few years.

2/ ANALYSING THE COMPANY'S INVESTMENT POLICY

Through the production process, fixed assets are used up. The annual depreciation charge is supposed to reflect this wearing out. **By comparing capital expenditure with depreciation charges**, you can determine whether the company is:

expanding its industrial base by increasing production capacity. In this case, capital expenditure is higher than depreciation as the company invests more than simply to compensate for the annual wearing-out of fixed assets;

maintaining its industrial base, replacing production capacity as necessary. In this case, capital expenditure approximately equals depreciation as the company invests just to compensate for the annual wearing-out of fixed assets;

underinvesting or divesting (capital expenditure below depreciation). This situation can only be temporary or the company's future will be in danger, unless the objective is to liquidate the company.

Comparing capital expenditure with net fixed assets at the beginning of the period gives you an idea of the size of the investment programme with respect to the company's existing production facilities. A company that invests an amount equal to 50% of its existing net fixed assets is building new facilities worth half what it has at the beginning of the year. This strategy carries certain risks:

the risk that economic conditions will take a turn for the worse;

the risk that production costs will be difficult to control (productivity deteriorates);

technology risks, etc.

3/ ANALYSING THE CASH FLOWS GENERATED BY INVESTMENTS

The theoretical relationship between capital expenditures on the one hand and the cash flow from operating activities on the other is not simple. New fixed assets are combined with those already on the balance sheet, and together they generate the cash flow of the period. Consequently, there is no direct link between operating cash flow and the capital expenditure of the period.

Comparing cash flow from operating activities with capital expenditure makes sense only in the context of overall profitability and the dynamic equilibrium between sources and uses of funds.

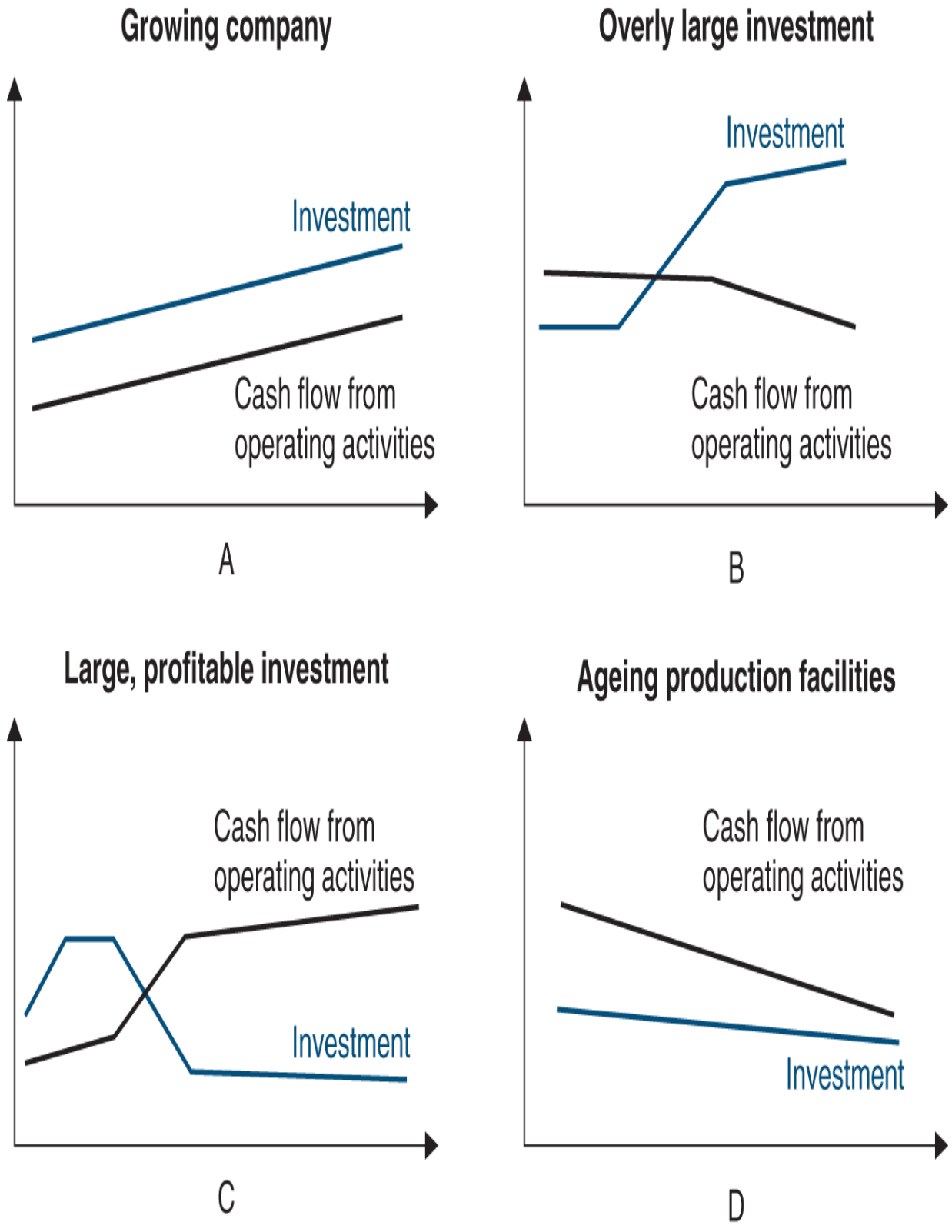
The only reason to invest in fixed assets is to generate profits, i.e. positive cash flows. Any other objective turns finance on its head. You must therefore be very careful when comparing the trends in capital expenditure and cash flow from operating activities. This analysis can be done by examining the cash flow statement.

> Any investment strategy must, sooner or later, result in an increase in cash flow from operating activities. If it doesn't, then the investments are not profitable enough and the company is heading for trouble or, more likely, is already in trouble.

Be on the lookout for companies that, for reasons of hubris, grossly overinvest, despite their cash flow from operating activities not growing at the same rate as

their investments. Management has lost sight of the all-important criterion that is profitability.

All the above does not mean that capital expenditure should be financed by internal sources only. Our point is simply that a good investment policy grows cash flow at the same rate as capital expenditure. This leads to a virtuous circle of growth, a necessary condition for the company's financial equilibrium, as shown in graph A in this figure:



Graphs B, C and D illustrate other corporate situations. In D, investment is far below the company's cash flow from operations. You must compare investment

with depreciation charges so as to answer the following questions:

Is the company living off the assets it has already acquired (profit generated by existing fixed assets)?

Is the company's production equipment ageing?

Are the company's current capital expenditures appropriate, given the rate of technological innovation in the sector?

Naturally, the risk in this situation is that the company is resting on its laurels, and that its technology is falling behind that of its competitors. This will eat into the company's profitability and, as a result, into its cash flow from operating activities at the very moment it will most need cash in order to make the investments necessary to close the gap vis-à-vis its rivals.

> The most important piece of information to be gleaned from a cash flow statement is the relationship between capital expenditure and cash flow from operating activities and their respective growth rates.

Generally speaking, you must understand that there are certain logical inferences that can be made by looking at the company's investment policy. If its capital expenditure is very high, then the company is embarking on a project to create significant new value rather than simply growing. Accordingly, future cash flow from operating activities will depend on the profitability of these new investments and is thus highly uncertain.

Lastly, ask yourself the following questions about the company's divestments: do they represent recurrent transactions, such as the gradual replacement of a rental car company's fleet of vehicles, or are they one-off disposals? In the latter case, is the company's insufficient cash flow forcing the company to divest? Or is the company selling old, outdated assets in order to turn itself into a dynamic, strategically rejuvenated company? Is this asset-pruning?

4/ ANALYSING INVESTMENT CARRIED OUT THROUGH EXTERNAL GROWTH

Companies can grow their fixed asset base either through outright purchases (internal growth) or through acquisition of other companies owning fixed assets (external growth).

There are three main risks behind an external growth policy:

That of integrating assets and people, which is always easier on paper than in real life. This is the first reason why so many mergers fail to deliver on promises (see Chapter 45).

That of regular changes in the group perimeter, which complicates its analysis and can hide real difficulties (as illustrated by Steinhoff's difficulties).

That of having overpaid for acquired companies. By carrying out an analysis of prices paid (see Chapter 31), the external analyst can detect overpayments only if they are provided with enough information by the acquirer.

The frequency of acquisition of other companies gives clues about the concentration inside a sector. The higher the latter, the lower the former.

Section 11.5 CASE STUDY: ARCELORMITTAL[3]

1/ WORKING CAPITAL ANALYSIS

The average VAT rate of ArcelorMittal is not disclosed, so we have taken a rate of 20%.

In days (d) of net sales	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
$\frac{\text{Operating working capital}}{\text{Net sales}} \times 365$	58 d	52 d	54 d	46 d	39 d	50 d	54 d	61 d	50 d	30 d
$\frac{\text{Receivables}}{\text{Net sales}} \times 365$	35 d	34 d	39 d	33 d	35 d	41 d	39 d	38 d	34 d	39 d
$\frac{\text{Inventories and work in progress}}{\text{Net sales}} \times 365$	93 d	88 d	94 d	86 d	81 d	107 d	108 d	113 d	94 d	89 d
$\frac{\text{Payables}}{\text{Net sales}} \times 365$	46 d	44 d	51 d	48 d	45 d	70 d	67 d	63 d	57 d	69 d

In the most acute phase of its crisis, ArcelorMittal had been able to reduce its WCR by half, from $14.9bn in 2011 to $6.8bn in 2015, a drop of more than 50%, freeing up $8bn of cash, while sales had only dropped by a third. Part of this decline was mechanical as it was due to the drop in its sales, but another part was due to its own efforts as evidenced by a WCR of only 39 days in 2015. It was in the area of inventories that the most significant effort was made.

With the return to better health from 2016 to 2018, WCR ratios deteriorated and returned to their levels of the early 2010s, resulting in a cash outflow of $6bn. A company can indeed hardly maintain an iron discipline, even in the steel industry, specific to a period of potentially fatal crisis, when it is overcome. $8bn are regained in 2019–2020 when the economic situation for ArcelorMittal starts to deteriorate again.

2/ CAPITAL EXPENDITURE ANALYSIS

Unsurprisingly, given the steel industry situation, which reduces ArcelorMittal's self-financing capacity and does not encourage investment, the ratio of net fixed assets to gross fixed assets is declining: from 57% in 2015 to 55% in 2020, without however becoming worrying.

If in 2015, annual investments were 85% of depreciation (at about $2.7bn), since then they have gradually increased to 125%, and are devoted to maintenance and productivity improvements, and then again from 2018 onwards to volume growth. In 2020, they were reduced to 100% of a strongly reduced cash flow.

SUMMARY

The summary of this chapter can be downloaded from www.vernimmen.com.

A company's working capital is the balance of the accounts directly related to its operating cycle (essentially customer receivables, accounts payable and inventories). Calculated at the year-end closing date, it is not necessarily representative of the company's permanent requirement. Therefore, you must look at how it has evolved over time.

All of the components of working capital at a given point in time disappear shortly thereafter. Inventories are consumed, suppliers are paid and receivables are collected. But even if these components are consumed, paid and collected, they are replaced by others. Working capital is therefore both liquid and permanent.

Working capital turnover ratios measure the average proportion of funds tied up in the operating cycle. The principal ratios are:

days' sales outstanding: accounts receivable / sales (incl. VAT) × 365;

days' payables outstanding: accounts payable / purchases (incl. VAT) × 365;

days' inventory outstanding: inventories and work in progress / sales × 365;

working capital turnover: working capital / sales × 365.

When a company grows, its working capital has a tendency to grow because inventories and accounts receivable (via payment terms) increase faster than sales. Paradoxically, working capital generally continues to grow during periods of recession because restrictive measures do not immediately deliver their desired effect. It is only at the end of the recession that working capital subsides and cash flow problems ease.

A low or negative working capital is a boon to a company looking to expand.

The level of working capital is an indication of the strength of the company's strategic position, because it reflects the balance of power between the company and its customers and suppliers.

We evaluate a company's investment policy by looking at the following three criteria:

the extent to which production facilities are worn out, as measured by the net fixed assets/gross fixed assets ratio;

the purpose of capital expenditure – build up fixed assets, maintain them or let them run down – is determined by whether capital expenditure is greater than, equal to or less than depreciation;

analysis of the cash flow generated by investments. Any investment policy should, sooner or later, translate into increasing cash flows from operations. If not, the company will face financial difficulties.

QUESTIONS

1/Can it be said that the working capital calculated on the balance sheet is representative of the company's permanent needs?

2/If income is recorded on a company's books on the day it is received (and not on the invoice date) and costs on the date of payment, would this generate working capital? If so, how would this working capital differ from the working capital as calculated today?

3/Is the permanent part of working capital liquid?

4/Explain why, during a recession, working capital will decline at a slower pace than sales.

5/How does working capital behave in an inflationary period?

6/The financial director of a company makes the following comments: “The company performed remarkably well this year. You be the judge – our depreciation policy enabled us to generate 50% more EBITDA than last year. Our working capital has increased sharply, due to a more generous customer credit policy (three months instead of two) and to a significant increase in our inventories.” What do you think? What advice would you give?

7/The perfume division of Unilever has decided to launch a new perfume. During the first weeks following the launch, sales to retailers are high. Can the new perfume be considered a success?

8/An aeronautics group has substantial inventories of unfinished goods. What consequences will this have? What measures would you suggest to improve this situation?

9/Is calculating the ratio of non-operating working capital/sales a worthwhile exercise?

10/Do you believe that Internet retail businesses carry high working capital?

11/Do investments always take the form of capex?

12/In what kind of sector is capex very low?

13/In what sector is the largest investment in change in working capital?

You'll find more questions at www.vernimmen.com.

EXERCISES

1/The Belgian Vandeputte Group has the following operating structure: sales = 100, raw materials used in the business = 30, direct production costs = 40, administrative costs = 20. Operating cycle: raw materials inventories = 15 days, length of production cycle = one month, inventories of finished products = 15 days. Payment terms: suppliers two months, customers one month, other costs paid in cash.

Assuming zero VAT, calculate working capital in days of sales. The production cycle lasts one month, which means that in-progress inventories represent one month of raw materials and 15 days of production costs.

2/The operating details for Spalton plc are as follows:

permanent working capital equal to 25% of sales;

sales rise from 100 million in year 1 to 120 million in year 2;

EBITDA rises to 15% of sales in year 2.

Calculate operating cash flow (before financial expense and tax) in year 2.

3/Working capital for Moretti SpA over the last five years (at 31 December) was as follows:

(In €m)	**2017**	**2018**	**2019**	**2020**	**2021**
Inventories of finished goods	6.1	7.4	9.1	13	15.4
Trade and notes receivable	6.4	8.9	10.5	11.1	11.6
Trade and notes payable	2.1	3.5	3.5	3.8	3.4

The income statement includes the following data:

(In €m)	**2017**	**2018**	**2019**	**2020**	**2021**
Sales (excl. VAT)	32.8	44.7	49.4	48.9	50
Sales (incl. VAT)	38.9	52.6	58.1	57.4	57.2
Purchases (incl. VAT)	12.5	19.2	19.6	20.9	20.4

Calculate the different working capital ratios.

4/Below are the operating terms and conditions of a trading company:

goods held for resale rotate four times a year;

cost of goods sold is equal to 60% of sales (excl. tax);

customers pay at 45 days from month-end;

suppliers are paid at 30 days;

salaries, which amount to 10% of pre-tax sales, are paid at the end of every month;

payroll taxes, which amount to 50% of salaries, are paid on the 15th of the following month;

operating charges, other than purchases of goods for resale and staff costs, are paid in cash;

VAT is payable at 20% on sales and purchases. VAT payable for month *n* equals the difference between VAT collected on sales in month *n* and VAT recoverable on sales in month *n*, and is paid at the latest on the 25th of the month (*n* + 1).

Using the above data, calculate the working capital of the company in days of sales (excl. VAT).

5/Below are details of a distribution company's operating terms and conditions:

days of goods held for resale: 24.3 days;

supplier credit: 90 days;

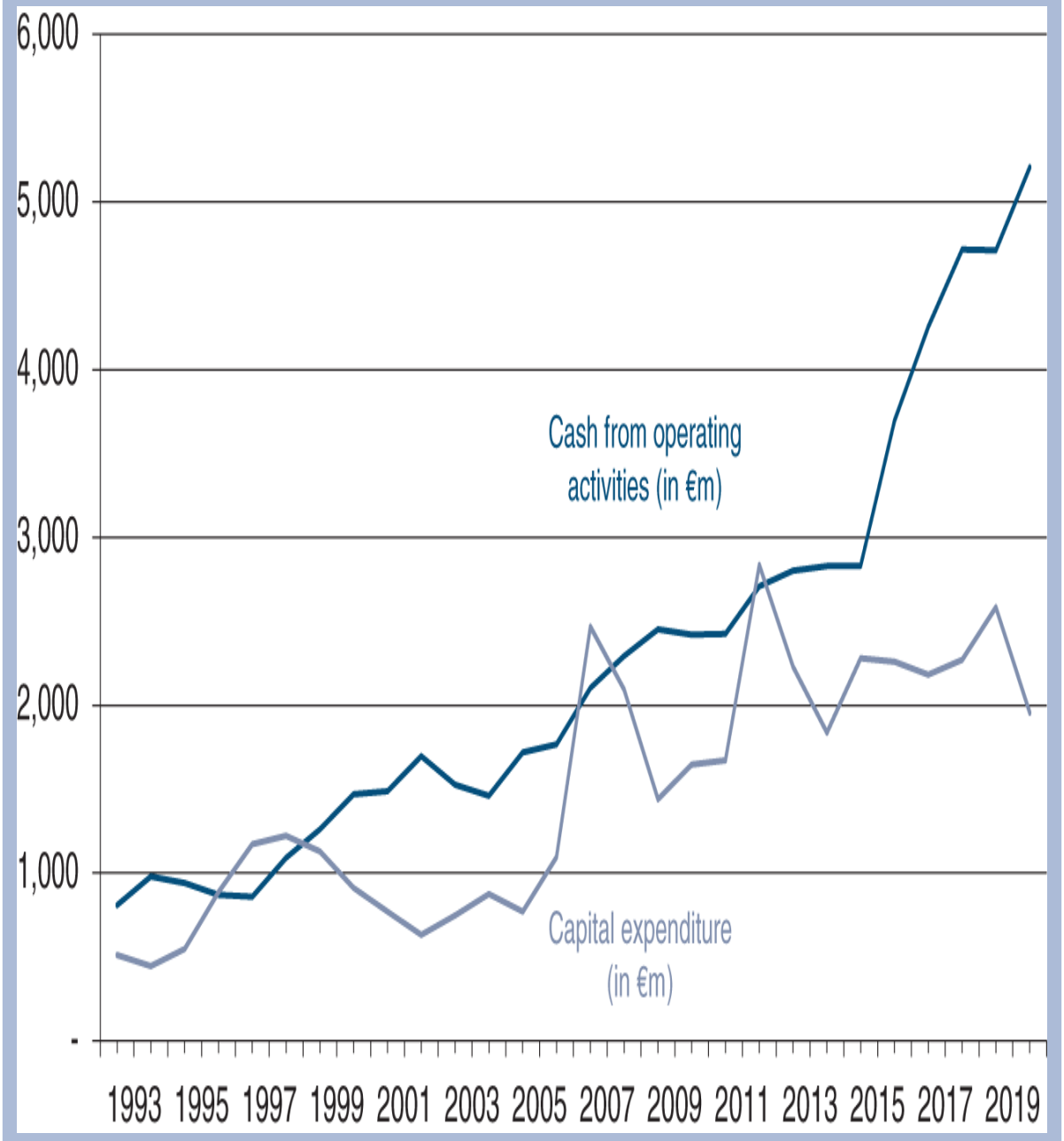
customer credit: 10 days;

purchases: 75% of sales;

no VAT.

Calculate normal working capital as a percentage of sales.

6/Give your views of Air Liquide's investment policy since 1993, as represented in the following graph (data in €m):



ANSWERS

Questions

1/*No, because of the seasonality of most businesses.*

2/*Yes, it would, as working capital depends primarily on the time difference between payment to suppliers and payment from customers, which would not be substantially modified by a change in accounting rules; with an adjustment of working capital and shareholders' equity.*

3/*Yes, because each item of working capital is sold, paid by the company or its suppliers.*

4/*As a result of inertia.*

5/*It tends to increase even if the number of products sold stays constant.*

6/*Everything is mixed up. A depreciation charge does not affect EBITDA (as EBITDA is computed before depreciation charges). Working capital has increased considerably. Have a look at the change in net debt, which may be large and become a risk factor for the company. Change your CFO or offer him a Vernimmen book!*

7/*No, the retailers are taking in stock, but not necessarily selling any!*

8/*Very high working capital. Down payments by customers, pre-financing of production by state authorities, pass on to subcontractors, etc.*

9/*Not really, given that non-operating working capital is such a catch-all category and varies so erratically.*

10/*No, as the client pays first and the product is delivered generally only a few days later.*

11/*They can also take the form of operating losses.*

12/*Sale of grey matter: advertising, consultancy, legal services.*

13/*Cognac (seven years in barrels).*

Exercises

A detailed Excel version of the solutions is available at www.vernimmen.com.

1/

Working capital component	% of sales	Time taken to shift goods or payment period	Value in days of sales
Raw materials	30%	15 days	4.5 days
+ Work in progress	30% × 30 days + 40% ×	15 days	15 days
+ Inventories of finished products	70%	15 days	10.5 days
+ Trade receivables	100%	30 days	30 days
− Trade payables	30%	60 days	−18 days
= Total			42 days

2/*Operating cash flow (before taxes and financial expense) = EBITDA − ΔWC = 15% × 120 − 25% × (120 – 100) = €13m.*

3/

	2017	2018	2019	2020	2021
Working capital (WC)	10.4	12.8	16.1	20.3	23.6
WC in days of sales (excl. VAT)	116	105	119	152	172
Outstanding receivables in days of sales (incl. VAT)	60	62	66	71	74
Days of inventories	68	60	67	97	112
Days of payables in days of purchases (incl. tax)	61	67	65	66	61

The economy is in recession and the company has not yet adjusted production and is keeping sales up by offering customers better payment terms.

4/

Working capital component	% of sales	Time taken to shift goods or payment period	Value in days of sales
Inventories of goods for resale	60%	90 days	54 days
+ Trade receivables	120%	30/2 + 45 = 60 days	72 days
− Accounts payable	−72%	30 days	21.6 days
− Personnel cost	10%	15 days	1.5 days
− Social security contribution payable	5%	30/2 + 15 = 30 days	1.5 days
− VAT payable	(20% − 20 × 60% = 8%)	30/2 + 25 = 40 days	3.2 days
= Total			98.2 days

5/

Working capital component	% of sales	Time taken to shift goods or payment period	Value in days of sales
Inventories of goods for resale	75%	24.3 days	18.2 days
+ Trade receivables	100%	10 days	10 days
− Accounts payable	75%	90 days	67.5 days
= Total			−39.2 days

6/*Since 1993, Air Liquide has alternated investment phases that are significantly greater than in previous years (often double), such as in 1996–1999 or in 2006–2008 and 2012–2013, followed by much more moderate investment phases. The phases of high investment generally follow periods when cash flow from operations had stagnated (1993–1995, 2000–2005, 2009–2011 and 2013–2015). The phases of major investment efforts are followed by periods of accelerated growth in operating cash flow (2000–2002, 2008–2009, 2016–2020), which demonstrate the profitability of these investments. The sharp increase in operating cash flow in 2017, despite a decline in tangible investments, is due to the acquisition of Airgas, which gave Air Liquide additional production capacity without new tangible investments.*

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NOTES

1 *Provided competitors have the same balance sheet closing date*.

2 *Net fixed assets are gross fixed assets minus cumulative depreciation*.

3 *Financial statements for ArcelorMittal are shown in Sections 4.2, 5/, 5.2 and 9.3*.

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Chapter 12
FINANCING

Tell me how you're financed and I'll tell you who you are

When you evaluate how a company is financed, you must perform both dynamic and static analyses.

As we saw in the previous chapter, when it is founded, a company makes two types of investment. Firstly, it invests to acquire land, buildings, equipment, etc. Secondly, it makes operating investments, specifically start-up costs and building up working capital.

To finance these investments, the company must raise either equity or debt financing. The investments, which initially generate negative cash flows, must generate positive cash flows over time. After subtracting interest paid, as well as taxes, these cash flows must enable the company to repay its borrowings and eventually pay dividends.

If the circle is a virtuous one, i.e. if the cash flows generated are enough to meet interest and dividend payments and repay debt, the company will gradually be able to grow and, as it repays its debt, it will be able to borrow more (the origin of the illusion that companies never repay their loans).

Conversely, the circle becomes a vicious one if the company's resources are constantly tied up in new investments or if cash flow from operating activities is chronically low. The company systematically needs to borrow to finance capital expenditure, and it may never be able to pay off its debt, not to mention pay dividends.

Evaluating these matters is the **dynamic approach**.

In parallel with the dynamic approach, you must look at the current state of the company's finances with three questions in mind:

- Given the proportion of the company's assets financed by bank and other financial debt and the free cash flow generated by the company, can the company repay its debt?
- Given the term structure of the company's debt, is the company running a high risk of illiquidity?
- Is the company indebted in a currency in which it does not generate free cash flow? If so, the company is taking a foreign exchange risk.

This is the **static approach**.

Section 12.1 A DYNAMIC ANALYSIS OF THE COMPANY'S FINANCING

To perform this analysis you will rely on the cash flow statement.

1/ THE FUNDAMENTAL CONCEPT OF CASH FLOW FROM OPERATING ACTIVITIES

The cash flow statement (see Chapter 5) is designed to separate operating activities from investing and financing activities. Accordingly, it shows cash flows from operating and investing activities and investments on the one hand, and from financing activities on the other. This breakdown will be very useful to you when valuing the company and examining investment decisions.

The concept of cash flow from operating activities, as shown by the cash flow statement, is of the utmost importance. It depends on three fundamental parameters:

the rate of growth in the company's business;

the amount and nature of operating margins;

the amount and nature of working capital.

An analysis of the cash flow statement is therefore the logical extension of the analysis of the company's margins and the changes in working capital.

Analysing the cash flow statement means analysing the profitability of the company from the point of view of its operating dynamics, rather than the value of its assets.

2/ FREE CASH FLOW AFTER INTEREST

Free cash flow after interest is equal to cash flows from operating activities minus cash flows from investments (capex net of disposal of fixed assets). It therefore includes the investment policy of the firm.

Free cash flow after interest measures, if negative, the financial resources that the company will have to find externally (from its shareholders or lenders) to meet the needs for cash generated by its operating and

investment activities. If positive, the firm will be able to reduce its debt, to pay dividends without having to raise debt or even to accumulate cash for future needs. Free cash flow after interest will therefore set the tune for the financing policy.

3/ HOW IS THE COMPANY FINANCED?

As an analyst, you must understand how the company finances its activities over the period in question. New equity capital? New debt? Reinvesting cash flow from operating activities? Asset disposals can contribute additional financial resources.

You should focus on three items for this analysis: equity capital issues, debt policy and dividend policy.

Financing through new equity issuance: did the firm call for new equity from its shareholders during the period and, if yes, what was it used for (to reduce debt, to finance a new capex programme)? You can also come across the opposite situation whereby the company buys back part of its shares; this, like dividends, is a way of returning cash to shareholders.[1] In this case, does the company want to alter its financial situation? Does it no longer have any investment opportunities?

Financing through debt: analysing the net increase or decrease in the company's debt burden is a question of financial structure:

> If the company is paying down debt, is it doing so in order to improve its financial structure? Has it run out of growth opportunities?
>
> If the company is increasing its debt burden, is it taking advantage of unutilised debt capacity? Or is it financing a huge investment project or reducing its shareholders' equity and upsetting its financial equilibrium in the process?

The dividend policy: as we will see in Chapter 37, the company's dividend policy is also an important aspect of its financial policy. It is a valuable piece of information when evaluating the company's strategy during periods of growth or recession:

Is the company's dividend policy consistent with its growth strategy?

Is the company's cash flow reinvestment policy in line with its capital expenditure programme?

You must compare the amount of dividends with the investments and cash flows from operating activities of the period.

In Section III of this book, we will examine the more complex reasoning processes that go into determining investment and financing strategies. For the moment, keep in mind that analysis of the financial statements alone can only result in elementary, common-sense rules.

As you will see later, we stand firmly **against** the following “principles”:

The amount of capital expenditure must be limited to the cash flow from operating activities. **No!** After reading Section III you will understand that the company should continue to invest in new projects until their marginal profitability is equal to the required rate of return. If it invests less, it is underinvesting; if it invests more, it is overinvesting, even if it has the cash to do so.

The company can achieve equilibrium by having the “cash cow” divisions finance the “glamour”[2] divisions. **No!** With the development of financial markets, every division whose profitability is commensurate with its risk must be able to finance itself. A “cash cow” division should pay the cash flow it generates over to its providers of capital, who are then free to reinvest those funds in other projects.

Studying the equilibrium between the company's various cash flows in order to set rules is tantamount to considering the company a world unto itself. This approach is diametrically opposed to financial theory. It goes without saying, however, that you must determine the investment cycle that the company's financing cycle can support. In particular, debt repayment ability remains paramount. We have already warned you about that in Chapter 2!

Section 12.2 A STATIC ANALYSIS OF THE COMPANY'S FINANCING

Focusing on a multi-year period, we have examined how the company's margins, working capital and capital expenditure programmes determine its various cash flows. We can now turn our attention to the company's absolute level of debt at a given point in time and to its capacity to meet its commitments while avoiding liquidity crises.

1/ CAN THE COMPANY REPAY ITS DEBTS?

The best way to answer this simple, fundamental question is to take the company's business plan and project future cash flow statements. These statements will show you whether the company generates enough cash flow from operating activities such that after financing its capital expenditure, it has enough left over to meet its debt repayment obligations without asking shareholders to reach into their pockets. If the company must indeed solicit additional equity capital, you must evaluate the market's appetite for such a capital increase. This will depend on who the current shareholders are. A company with a core shareholder will have an easier time than one whose shares are widely held, as this core shareholder, knowing the company well, may be in a position to underwrite the share issue. It will also depend on the value of equity capital (if it is near zero, maybe only a **vulture fund**[3] will be interested).

Naturally, this assumes that you have access to the company's business plan, or that you can construct your own from scenarios of business growth, margins, changes in working capital and likely levels of capital expenditure. We will take a closer look at this approach in Chapter 31.

Analysts and lending banks have, in the meantime, adopted a “quick-and-dirty” way to appreciate the company's ability to repay its debt: the ratio of net debt to EBITDA. This is, in fact, the most often used financial covenant[4] in debt contracts! This highly empirical measure is nonetheless considered useful, because EBITDA is very close to cash flow from operating activities, give or take changes in working capital, interest and income tax. A value of 3 is considered a critical level, below which the company should generally be able to meet its repayment obligations.

If we were to oversimplify, we would say that a value of 3 signifies that the debt could be repaid in 3 years provided the company halted all capital expenditure and didn't pay corporate income tax during that period. Of course, no one would ask the company to pay off all its debt in the span of 3 years, but the idea is that it could if it had to.

Conversely, a firm with debt representing 5 times EBITDA would have to stop any investment for 5 years to meet its repayment commitments as scheduled and would be in bad shape at the end of the period.

Also, practitioners believe:

that below a net debt/EBITDA ratio of 2, the company should not have any repayment problems;

that between 2 and 4, the situation deserves a more precise analysis depending on the company's sector of activity. For example, bankers are more willing to lend large amounts relative to EBITDA when cash flows are predictable and stable (infrastructure, agribusiness, telecom, real estate, etc.) than when flows are sensitive to the economy (technology, capital goods, oil services, etc.);

that from 4 to 7, the company's debt is in all likelihood excessive, except in the case of LBOs, as we will see in Chapter 49. Debt then becomes a high-yield product, but also a high-risk one! These are the high yield loans. We are then in the leverage finance world;

that beyond 7, even for an LBO, debt is excessive.

Naturally, these ratio levels should be taken for what they are: indications and not absolute references that change over time according to the lender's risk appetite. Moreover, the lender will be sensitive to the actual cash generation capacity: if past cash flow statements consistently show negative free cash flow after financial expenses, banks will find it very difficult to lend, even if EBITDA is comfortable.

Accordingly, when changes in working capital are not negligible compared with the amount of EBITDA, the net debt/EBITDA ratio loses its relevance.

The following table shows trends in the net debt/EBITDA ratio posted by various different sectors in Europe between 2005 and 2022e.

Sector	2005	2010	2015	2016	2017	2018	2019	2020	2021e	2022e
Aerospace & Defence	0.6	0.3	0.5	0.4	NS	NS	0.1	1.0	0.7	0.3
Automotive	0.3	NS	NS	NS	NS	NS	NS	NS	NS	NS
Beverages	2.1	2.8	2.6	4.4	3.7	3.6	3.6	3.7	3.3	2.8
Building Materials	1.8	2.5	1.6	1.5	1.4	1.5	1.2	0.9	0.7	0.5
Business Services	1.5	2.0	2.3	2.5	2.7	2.7	2.4	2.4	2.0	1.6
Capital Goods	1.3	0.6	1.2	1.1	0.9	0.9	0.8	0.9	0.7	0.4
Chemicals	0.9	1.0	1.5	1.6	1.4	1.9	1.9	1.8	1.7	1.5
Consumer Goods	1.4	0.2	0.2	1.3	1.0	1.0	1.1	0.9	0.6	0.3
Food & HPC	1.0	0.5	0.8	0.8	1.4	1.4	1.2	1.3	1.1	1.0
Food Retail	2.2	1.5	1.9	1.5	1.3	1.0	0.8	0.8	0.6	0.5
General Retail	0.1	NS	NS	NS	NS	NS	NS	NS	NS	NS
IT Hardware	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
IT Services	NS	0.5	1.0	0.9	1.0	1.9	1.3	2.1	1.7	1.1
Leisure & Hotels	2.2	1.6	1.4	1.9	1.9	1.4	1.4	3.6	2.2	1.3
Luxury Goods	1.0	0.2	0.1	NS	0.1	0.1	0.1	NS	0.1	NS
Media	1.2	1.4	1.2	1.8	1.6	1.5	1.7	2.0	1.4	0.9
Medtech & Services	0.9	1.3	2.2	1.8	2.1	1.8	1.8	1.9	1.5	1.2
Mining	0.4	0.3	2.5	1.3	0.8	0.8	0.9	0.6	0.4	0.3
Oil & Gas	0.3	0.7	1.2	2.1	1.3	1.0	1.2	1.8	1.5	1.0
Paper & Packaging	2.5	2.4	2.6	2.2	2.0	1.6	1.6	1.5	1.6	1.4

Sector	2005	2010	2015	2016	2017	2018	2019	2020	2021e	2022e
Software	NS	0.4	0.9	0.8	0.5	0.8	1.5	1.6	1.2	0.8
Steel	0.8	2.6	3.3	2.4	1.7	1.7	2.6	4.9	0.9	0.6
Telecom Operators	1.9	2.0	2.5	2.4	2.3	2.4	2.2	2.1	2.2	2.2
Transport & Infrastructure	1.8	2.6	1.9	2.1	1.8	2.3	1.8	4.2	2.4	1.8
Utilities	1.9	2.8	3.1	3.0	3.2	3.2	3.1	3.2	3.2	3.1

Source: Exane BNP Paribas

Telecom operators and utilities are among the most highly leveraged sectors. One explanation is their capital intensity, which is strong. Another is the willingness of lenders to lend money to these sectors given their high long-term visibility on cash flows (concession contracts).

Similarly, analysts look at the interest coverage ratio, ICR (or debt service coverage or debt service ratio), i.e. the ratio of EBIT to net interest expense. A ratio of 3:1 is considered the critical level. Below this level, there are serious doubts as to the company's ability to meet its obligations as scheduled, as was the case for the transport sector post 9/11. Above it, the company's lenders can sleep more easily at night!

Rating agencies generally prefer to consider the ratio cash flow to net debt (they call our cash flow “funds from operations”, or FFO). It is true that cash flow is closer than EBITDA to the actual capacity of the firm to repay its debt.

Not so long ago, the company's ability to repay its loans was evaluated on the basis of its debt-to-equity ratio, or gearing, with a 1:1 ratio considered the critical point.

Certain companies can support bank and other financial debt in excess of shareholders' equity, specifically companies that generate high operating cash flow. Getlink (Eurotunnel), the company which operates the Channel Tunnel and generates robust cash flows, is an example. Conversely, other companies would be unable to support debt equivalent to more than 30% of their equity, because their margins are very thin. For example, the operating

profit of Balfour Beatty, the construction company, is at best only 1.5% of its sales revenue.

> We advise against using the debt-to-equity ratio as a measure of the company's repayment capacity: shareholders' equity capital serves to repay loans only in the event of bankruptcy, not in the ordinary course of business.

The debt-to-equity ratio is still computed by some analysts and used in some debt contracts in particular for SMEs. It is an unfortunate illustration of inertia of concepts in finance.

If you insist on using equity to compute debt ratios, it is better to use the ratio of net debt divided by the market value of equity. Equity is thus taken into account for what it is worth and not for a book amount, which is, most of the time, far from economic reality. Nevertheless, this ratio presents the drawback of being quite volatile due to the volatility in the equity's value.

2/ IS THE COMPANY RUNNING A LIQUIDITY RISK?

To understand the notion of liquidity, look at the company in the following manner: at a given point in time, the balance sheet shows the company's assets and commitments. This is what the company has done in the past. Without planning for liquidation, we nevertheless attempt to classify the assets and commitments based on how quickly they are transformed into cash. When will a particular commitment result in a cash disbursement? When will a particular asset translate into a cash receipt?

> A company is illiquid when it can no longer meet its scheduled commitments with its available resources.

To meet its commitments, either the company has assets it can monetise or it must contract new loans or initiate a capital increase. Of course, just like capital increases, obtaining a new loan depends on the company and its specific situation, and is therefore uncertain.

Illiquidity comes about when the maturity of the assets is greater than that of the liabilities. Suppose you took out a loan, to be repaid in six months, to

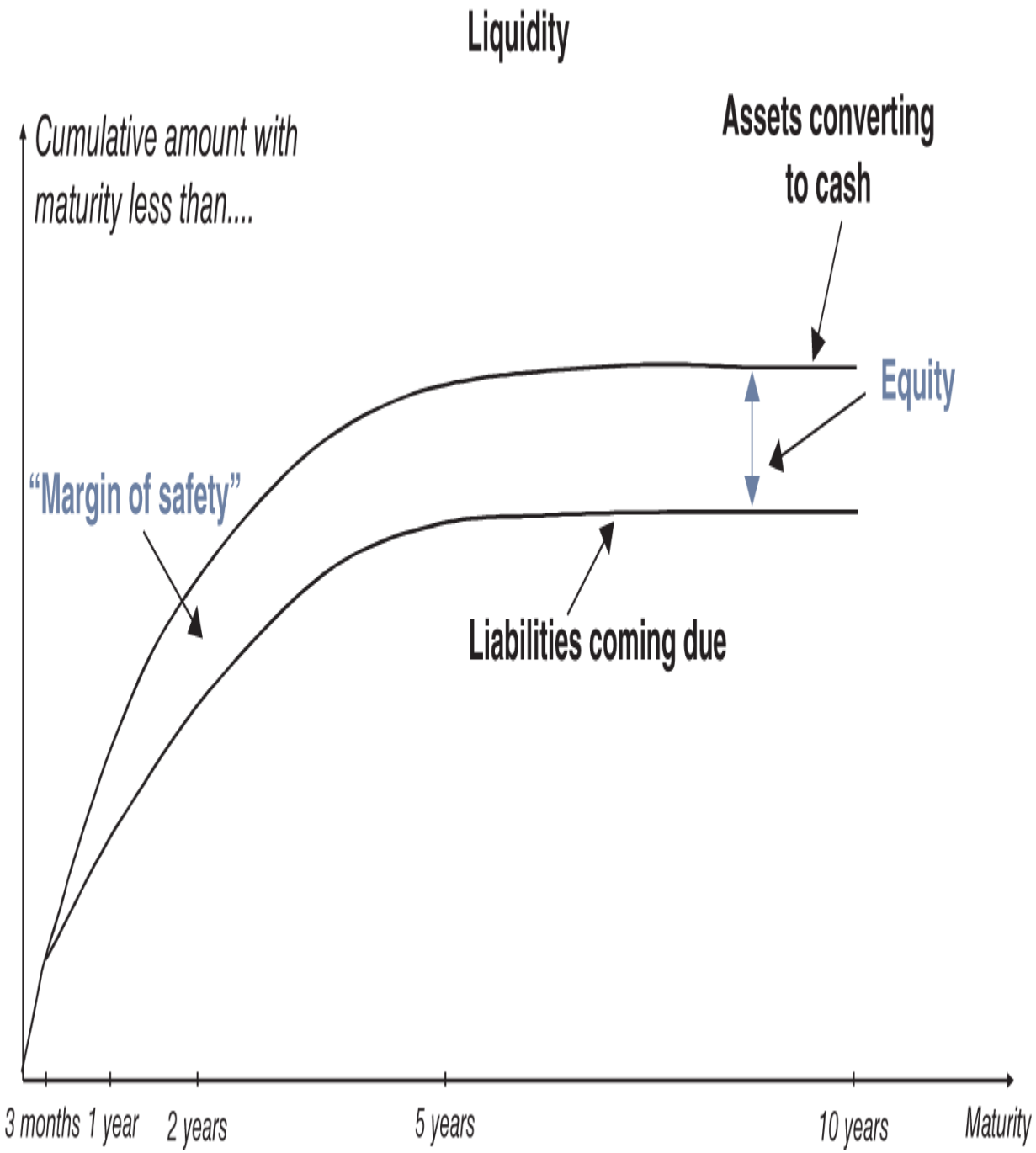
buy a machine with a useful life of three years. The useful life of the machine is out of step with the scheduled repayment of the loan and the interest expenses on it. Consequently, there is a risk of illiquidity, particularly if there is no market to resell the machine at a decent price and if the activity is not profitable. Similarly, at the current asset level, if you borrow three-month funds to finance inventories that turn over in more than three months, you are running the same risk.

> The risk of illiquidity is the risk that assets will become liquid at a slower pace than the rate at which the liabilities will have to be paid, because the maturity of assets is longer. In a sense, liquidity measures the speed at which assets turn over compared with liabilities.

An illiquid company is not necessarily required to declare bankruptcy, but it must find new resources to bridge the gap. In so doing, it forfeits some of its independence because it will be obliged to devote a portion of its new resources to past uses. In times of recession, it may have trouble doing so, and indeed be forced into bankruptcy.

We say that a balance sheet is liquid when, for each maturity, there are more assets being converted into cash (inventories sold, receivables paid, etc.) than there are liabilities coming due.

This graph shows, for each maturity, the cumulative amount of assets and liabilities coming due on or before that date.

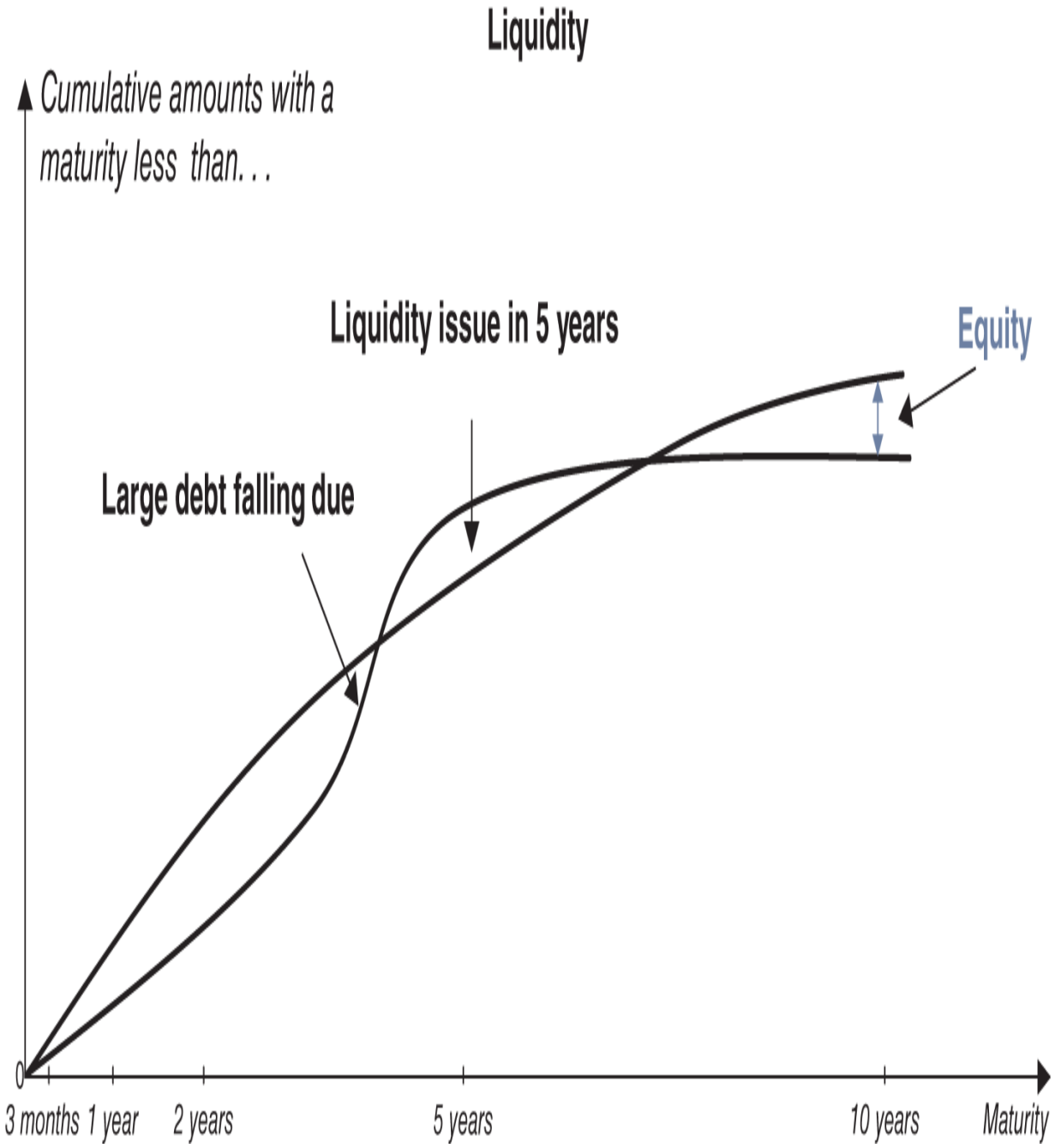


Liquidity

If, for a given maturity, cumulative assets are less than cumulative liabilities, the company will be unable to meet its obligations unless it finds a new source of funds. The company shown in this graph is not in this situation.

What we are measuring is the **company's maturity mismatch**, similar to that of a financial institution that borrows short-term funds to finance long-term assets.

However, in real life, things are often more complex than the situation represented by the smoothed curves of the above graph. For example, the graph for a company with large debts maturing in five years would look like this:



Liquidity bis

The company will have to manage its debt (refinance) within a few years, or even restructure it (see Section 39.3).

Failure to comply with a covenant (see Section 39. 2) on a company's debt, by making it immediately due and payable, regardless of its residual maturity, considerably increases the company's liquidity risk. The accounting system immediately reflects this by downgrading medium- or

long-term debts to short-term debts. The analyst must therefore not forget to take into account the proximity of the company to its covenants when assessing this risk.

(a) Liquidity ratios

To measure liquidity, then, we must compare the maturity of the company's assets to that of its liabilities. This rule gives rise to the following liquidity ratios, sometimes used in loan covenants. They enable banks to monitor the risk of their borrowers.

Current ratio:

$$\frac{\text{Current assets (less than one year)}}{\text{Current liabilities (due in less than one year)}}$$

This ratio measures whether the assets to be converted into cash in less than one year exceed the debts to be paid in less than one year.

The **quick ratio** is another measure of the company's liquidity. It is the same as the current ratio, except that inventories are excluded from the calculation. Using the quick ratio is a way of recognising that a portion of inventories corresponds to the minimum the company requires for its ongoing activity. As such, they are tantamount to fixed assets. It also recognises that the company may not be able to liquidate the inventories it has on hand quickly enough in the event of an urgent cash need. Certain inventory items have value only to the extent they are used in the production process. The quick ratio (also called the acid test ratio) is calculated as follows:

$$\frac{\text{Current assets (less than one year) excluding inventories}}{\text{Current liabilities (due in less than one year)}}$$

A quick ratio below one means the company might have short-term liquidity problems as it owns less current assets than it owes to its short-term lenders. If the latter stop granting it payment facilities, it will need a cash injection from shareholders or long-term lenders or face bankruptcy.

Finally, the **cash ratio** completes the set:

$$\frac{\text{Cash and cash equivalents}}{\text{Current liabilities (due in less than one year)}}$$

The cash ratio is generally very low. Its fluctuations often do not lend themselves to easy interpretation.

(b) More on the current ratio

Traditional financial analysis relies on the following rule:

> A company must maintain a buffer between sources and uses of funds maturing in less than one year to cover risks inherent in its business (loss of inventory value, customers that fail to pay, decline in sales, business interruption costs that suddenly reduce shareholders' equity capital), because liabilities are not subject to such losses in value.

By maintaining a current ratio above one (more current assets than current liabilities), the company protects its creditors from uncertainties in the "gradual liquidation" of its current assets, namely in the sale of its inventories and the collection of its receivables. These uncertainties could otherwise prevent the company from honouring its obligations, such as paying its suppliers, servicing bank loans or paying taxes.

If we look at the long-term portion of the balance sheet, a current ratio above one means that sources of funds due in more than one year, which are considered to be stable,[5] are greater than fixed assets, i.e. uses of funds "maturing" in more than one year. If the current ratio is below one, then fixed assets are being financed partially by short-term borrowings or by a negative working capital. This situation can be dangerous. These sources of funds are liabilities that will very shortly become due, whereas fixed assets "liquidate" only gradually in the long term.

The current ratio was the cornerstone of any financial analysis years ago. This was clearly excessive. The current ratio reflects the choice between short-term and long-term financing. In our view, this was a problem typical of the credit-based economy, as it existed in the 1970s in Continental

Europe. Today, the choice is more between shareholders' equity capital and banking or financial debt, whatever its maturity. Liquidity is managed through undrawn lines of credit which, as such, do not appear on the balance sheet. Nevertheless, they enabled a good number of groups to get through the liquidity crisis of spring 2020 without major damage thanks to the financial flexibility they provided. That said, **we still think it is unhealthy to finance a permanent working capital with very short-term resources. The company that does so will be defenceless in the event of a liquidity crisis, which could push it into bankruptcy.**

(c) Financing working capital

To the extent that working capital represents a permanent need, logic dictates that permanent financing should finance it. Since it remains constant for a constant business volume, we are even tempted to say that it should be financed by shareholders' equity. Indeed, companies with high working capital are often largely funded by shareholders' equity. This is the case, for example, with big champagne companies, which often turn to the capital markets for equity funding.

Nevertheless, most companies would be in an unfavourable cash position if they had to finance their working capital strictly with long-term debt or shareholders' equity. Instead, they often use revolving credits, which we will discuss in Chapter 21. For that matter, the fact that the components of working capital are self-renewing encourages companies to use revolving credit facilities in which customer receivables and inventories often collateralise the borrowings.

By their nature, revolving credit facilities are always in effect, and their risk is often tied directly to underlying transactions or collateralised by them (receivables, inventory, etc.). Full and permanent use of short-term revolving credit facilities can often be dangerous, because it:

exhausts borrowing capacity;

inflates interest expense unnecessarily;

increases the volume of relatively inflexible commitments, which will restrict the company's ability to stabilise or restructure its activity.

Working capital is not only a question of financing. It can carry an operational risk as well. Short-term borrowing does not exempt the company from strategic analysis of how its operating needs will change over time. This is a prerequisite to any financing strategy.

Companies that export a high proportion of their sales or that participate in construction and public works projects are risky inasmuch as they often have insufficient shareholders' equity compared with their total working capital. The difference is often financed by revolving credits, until one day, when the going gets rough …

In sum, you must pay attention to the true nature of working capital, and understand that a short-term loan that finances permanent working capital cannot be repaid by the operating cycle except by squeezing that cycle down, or in other words, by beginning to liquidate the company.

(d) Companies with negative working capital

Companies with a negative working capital raise a fundamental question for the financial analyst. Should they be allowed to reduce their shareholders' equity on the strength of their robust, positive cash position?

Can a company with a negative working capital maintain a financial structure with relatively little shareholders' equity? This would seem to be an anomaly in financial theory. On the practical level, we can make two observations.

Firstly, under normal operating conditions, the company's overall financing structure is more important and more telling than the absolute value of its negative working capital.

Let's look at companies *A* and *B*, whose balance sheets are as follows:

Company *A*			
Fixed assets	900	Shareholders' equity	800
Working capital	1,000	Net debt	1,100

Company *B*			
Fixed assets	125	Shareholders' equity	100
Cash & cash equiv.	105	Neg. working capital	130

Most of company *A*'s assets, in particular its working capital, are financed by debt. As a result, the company is much more vulnerable than company *B*, where the working capital is well into negative territory and the fixed assets are mostly financed by shareholders' equity.

Secondly, a company with a negative working capital reacts much more quickly in times of crisis, such as recession. Inertia, which hinders positive working capital companies, is not as great.

Nevertheless, a negative working capital company runs two risks:

The payment terms granted by its suppliers may suddenly change. This is a function of the balance of power between the company and its supplier, and unless there is an outside event, such as a change in the legislative environment, such risk is minimal. On the contrary, when a company with a negative working capital grows, its position vis-à-vis its suppliers tends to improve. Nevertheless, the tendency (including regulatory) to reduce payment periods has a mechanically negative impact on firms with negative working capital.

A contraction in the company's business volume can put a serious dent in its financial structure. Already negative working capital becoming less and less negative will prompt a cash drain on a company's financial resources, pushing it into financial difficulties unless it is able to use its available cash, if any, or raise new debt.

3/ IS THE COMPANY EXPOSED TO A FOREIGN EXCHANGE RISK?

For example, going into debt in euros when all assets and cash flows are in dollars, allows you to benefit from lower euro interest rates, but also exposes you to a high exchange rate risk. Unless it is hedged (see Chapter 51), risk will become reality in the event of an appreciation of the euro. Some companies have disappeared as a result. It is therefore necessary to verify that this exchange risk has been properly assessed, or that hedges have been set up (swaps, options).

Section 12.3 CASE STUDY: ARCELORMITTAL[6]

Since 2016, ArcelorMittal's free cash flow after financial expenses has always been positive and cumulatively amounts to $12.1bn. This performance is primarily due to cash flow from operations far exceeding investments ($21.0bn, compared with $10.8bn), and reinforced by a $2.0bn reduction in working capital between 2016 and 2020 and asset disposals (in particular the sale of ArcelorMittal USA, the benefits of which will only be partially visible in 2020, as a large portion of the price was paid in shares).

ArcelorMittal carried out two share issues over the period, one of $3.1bn in 2016, the other of $2bn in 2020 (in the form of shares and bonds redeemable in shares), allowing it to further contribute to debt reduction after payment of dividends limited to $0.9bn over the period and a share buyback of $0.8bn in 2018–2020.

These $15.5bn (12.1 + 5.1 – 0.9 – 0.8) have reduced net debt by the same amount, from $29.5bn at the end of 2016 to $14.0bn at the end of 2020. Thanks to the recovery of EBITDA until 2018, the improvement in the net debt/EBITDA ratio is even greater: from 7.8 in 2015 to 2.4 in 2018. Debt was therefore under control, before the relapse in 2019 and the crisis in 2020 caused it to deteriorate again to 4.8 in 2019 and 4.2 in 2020, mainly due to a fall in EBITDA and despite a continued effort to reduce debt.

ArcelorMittal's debt is almost entirely composed of bonds whose maturities are well spread over several years with an average maturity of 5.2 years, which rules out a medium-term liquidity risk. ArcelorMittal also benefits from a $5.5bn undrawn bank credit line maturing in 2025, with covenants stipulating a maximum net debt/EBITDA ratio of 4.25, calculated on the basis of EBITDA excluding restructuring costs, and on the basis of debt that does not take into account pension commitments or the sale of receivables, contrary to our recommendations (see Section 9.2) and therefore to our calculations. At the beginning of the Covid-19 crisis, ArcelorMittal had put in place with its relationship banks a complementary line of $3bn. This line was never drawn and cancelled a few months later when management had sufficient visibility.

With $11.5bn in cash and undrawn credit lines as of 31 December 2020, ArcelorMittal's liquidity was not a concern at that date.

Net debt at the end of 2019 was 54% in euros and 39% in US dollars, roughly overlapping with the sales mix before the disposal of ArcelorMittal USA in December 2020. We can expect the group to rebalance its financing towards more euros in the future.

SUMMARY

The summary of this chapter can be downloaded from www.vernimmen.com.

Analysing how a company is financed can be performed either by looking at several fiscal years, or on the basis of the latest available balance sheet.

In the dynamic approach, your main analytical tool will be the cash flow statement. Cash flow from operating activities is the key metric.

Cash flow from operating activities depends on the growth rate of the business and on the size and nature of working capital. Cash flow from operating activities must cover capital expenditure, loan repayment and dividends. Otherwise, the company will have to borrow more to pay for its past use of funds.

The company uses shareholders' equity and bank or financial debts to finance its investments. These investments must gradually generate enough positive cash flow to repay debt and provide a return to shareholders.

In the static approach, analysis tries to answer the following three questions:

Can the company repay its debts as scheduled? To answer this question, you must build projected cash flow statements, based on assumed rates of growth in sales, margins, working capital and capital expenditure. To perform a simplified analysis, you can calculate the net debt/EBITDA ratio as long as the changes in working capital are negligible compared to EBITDA. Below 2 times, the analyst can sleep soundly; between 2 and 4, everything will depend on the company's sector of activity, which determines the stability of its cash flow; a ratio of 4 to 7 is only acceptable for LBOs; and above 7 times, the company will have a hard time paying back its debts. The operating income/financial expenses ratio is also used with a critical value of at least 3.

Is the company running the risk of being illiquid? To answer this question, you must compare the dates at which the company's liabilities will come due and the dates at which its assets will be liquidated. Assets should mature before liabilities. If they do, the company will remain liquid.

Is the company exposed to a foreign exchange risk on its debt? In other words, does it generate cash flows in the same currency as its debt?

QUESTIONS

1/Why is it imperative to analyse the cash flow statement?

2/Should capital expenditure levels depend on cash flow from operating activities?

3/Your marketing manager suggests that you launch a marketing drive, giving some customers discounts and advantageous payment terms. State your views.

4/Is financial expense included in cash flow from operating activities?

5/On what conditions can a banker lend a company seven times its EBITDA?

6/Is a company with a current ratio below 1 illiquid?

7/In your view, should short-term debt be separated out from medium- to long-term debt on the cash flow statement? Why?

8/Short-term interest rates are currently very low and you are offered a three-month loan. State your views.

9/The debt-to-equity ratio of National Grid (which owns the high-voltage electricity transmission network in the UK and in New England) was around 1.7 in 2019. State your views.

10/You are told that BP is partly indebted in dollars. What do you think of this?

11/They tell you that Penn Power (Pennsylvania power producer) is indebted in yen. What do you think of this?

You'll find more questions at www.vernimmen.com.

EXERCISES

1/Below are the key figures for the company Ivankovic over the last five years.

	1	2	3	4	5
Fixed assets	100	110	120	130	140
Working capital	200	225	250	280	315
EBITDA	38	40	44	48	52
Depreciation and amortisation	10	10	11	12	13
Financial expense	14	15	17	19	22
Income tax expense	7	7.5	8	8	8.5
Dividends	5	5	5	6	6

Draw up the cash flow statement for years two to five.

State your views.

2/Analyse and compare the summary cash flow statements of Retirement Home plc, Food Retail Inc. and Turbine SA for 2019 and 2020.

In £ or € million	Retirement Home plc		Food Retail Inc.		Turbine SA	
Cash flow from operating activities	139	237	1,827	1,731	1,146	2
Capital expenditure	280	235	−977	1,228	1,212	686
Capital increase	0	100	0	0	351	0
Dividends paid	26	32	252	209	243	259
Decrease in net debt	−193	70	2,591	204	194	−1,052

3/What is your view of Ringkvist AB?

Ringkvist AB	1	2	3
Cash flow from operating activities	400	700	1,600
Capital expenditure	1,000	1,300	1,400
Asset disposals	0	0	0
Capital increase	300	300	0
Dividends paid	0	0	50
Decrease in net debt	−300	−300	150

4/What is your view of Moser srl?

Moser srl	1	2	3
Cash flow from operating activities	400	300	−200
Capital expenditure	1,000	1,100	300
Asset disposals	0	0	300
Capital increase	300	0	600
Dividends	0	0	0
Decrease in net debt	−300	−800	400

5/What is your view of the liquidity of this company?

7-year fixed assets	200	Shareholders' equity	100
3-year fixed assets	200	5-year debts	200
3-month inventories	300	1-year debts	300
2-month receivables	100	1-month debts	400
1-day liquidities	200		
Total	**1,000**	**Total**	**1,000**

ANSWERS

Questions

1/*In order to emphasise the dynamic of returns on investments.*

2/*No, because financing can always be found for an investment that will bring returns, but sooner or later these returns must generate cash flows.*

3/*This will have a double impact on cash flow from operating activities (drop in margins and increase in working capital).*

4/*Yes, see Chapter 5.*

5/*Only if he has excellent visibility on future EBITDA, high interest margin, in the context of a credit bubble and with a strict debt contract limiting the flexibility of the borrower.*

6/*Potentially, unless working capital is even more negative, as it has fewer current assets that will be transformed into cash within one year than liabilities maturing in less than one year.*

7/*No, net decrease in debt provides more information (see Chapter 5).*

8/*How would you pay off a loan in three months? You run the risk of not being able to raise new funds when your cheap loan matures.*

9/*This level of debt can only be evaluated in relation to National Grid capacity to generate substantial cash flow. Most transmission companies generate high cash flows as capital expenditures have already been incurred. D/EBITDA ratio is 6.5.*

10/*It is normal for BP, because of its oil activity, to generate flows in dollars which allow it to be indebted in dollars without taking a currency risk.*

11/*Surprisingly, as clients in Pennsylvania do not pay their bill in yen, the company is taking a currency risk on its debt, unless it has hedged it, which needs to be verified.*

Exercises

A detailed Excel version of the solutions is available at www.vernimmen.com.

1/*Cash flow statement*

	2	3	4	5
Cash flow	17.5	19	21	21.5
Change in working capital	25	25	30	35
Cash flow from operating activities	7.5	−6	−9	−13.5
Capital expenditures	20	21	22	23
Dividends paid	5	5	5	6
Decrease in net debt	−32.5	−32	−36	−42.5

The company Ivankovic is in a high-growth and high-capital-expenditure phase. Ivankovic is unable to control working capital, hence a large cash deficit. This deficit is covered by debt, leading to a sharp rise in financial expense. The financial situation of Ivankovic is worsening and, if there is a slump in the economy, Ivankovic might face bankruptcy.

2/*Retirement Home plc is in a growth phase, its operating cash flows are lower than its heavy capital expenditure; it finances its operations by way of debt and share issues. Food Retail Inc. has reached maturity, its operating cash flows are sufficient to cover capital expenditure; it is in the process of deleveraging, by disposing of assets. Turbine SA is experiencing a major reduction in its operating cash flows as a result of lower demand on its main market (power plants) and is reducing capital expenditure but cannot prevent a major increase in debt.*

3/*Ringkvist AB is in a virtuous circle of growth. The company is investing, the investments are generating in-flows, cash from operating activities thus increases every year and the company does not need to borrow much. In period 3, Ringkvist AB generates enough cash through operating activities to finance its capital expenditures, pay dividends and stabilise its debt level.*

4/*Moser srl is in a vicious circle. Cash flow from operating activities declines from year to year. Moser srl thus has to borrow heavily in year 2 to finance its capital expenditure. In year 3, the company experiences serious cash shortfalls, since cash generated by operating activities is negative. The company is forced to call on its shareholders to bail it out. It also launches a programme to refocus on its core business, which leads to asset disposals. Net capital expenditures are thus nil. Moser srl must reduce its debt.*

5/*There is no guarantee of liquidity in one month (shortfall of 400 − 200 = 200), nor in one year (shortfall of 700 − 600 = 100), nor in five years (shortfall of 900 − 800 = 100). The company will have to restructure its debt quickly in order to postpone payment of instalments due.*

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E. Morellec, Asset liquidity, capital structure and secured debt, *Journal of Financial Economics*, **61**(2), 173–206, August 2001.

NOTES

1 *See Chapter 37.*

2 *A glamour division is a fast-growing, high-margin division.*

3 *An investment fund that buys the debt of companies in difficulty or subscribes to equity issues with the aim of taking control of the company at a very low price.*

4 *Clause in debt contracts restricting the freedom of the borrower until debt is above a certain level. For more on debt covenants, see Section 39.2.*

5 *Also called "permanent financing". This includes shareholders' equity, which is never due, and debts maturing after one year.*

6 *The financial statements for ArcelorMittal are in Sections 4.2, 5/, 5.2 and 9.3.*

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Chapter 13
RETURN ON CAPITAL EMPLOYED AND RETURN ON EQUITY

The leverage effect is much ado about nothing

So far we have analysed:

how a company can create wealth (margin analysis);

what kind of investment is required to create wealth: capital expenditure and increases in working capital;

how those investments are financed through debt or equity.

We now have everything we need to carry out an assessment of the company's efficiency, i.e. its profitability.

A company that delivers returns that are at least equal to those required by its shareholders and lenders will not experience financing problems in the long term, since it will be able to repay its debts and create value for its shareholders.

Hence the importance of this chapter, in which we attempt to measure the **book** profitability of companies.

Section 13.1 ANALYSIS OF CORPORATE PROFITABILITY

We can measure profitability only by studying returns in relation to the invested capital. If no capital is invested, there is no profitability to speak of.

Book profitability is the ratio of the wealth created (i.e. earnings) to the capital invested. **Profitability should not be confused with margins.** Margins represent the ratio of earnings to business volumes (i.e. sales or production), while profitability is the ratio of profits to the capital invested to generate the profits.

Above all, analysts should focus on the profitability of capital employed by studying the ratio of operating profit to capital employed, which is called return on capital employed (ROCE).

$$\text{Return on capital employed (ROCE)} = \frac{\text{Operating profit} \times (1 - \text{Corporate income tax rate})}{\text{Capital employed}}$$

Return on capital employed can also be considered as the **return on equity if net debt is zero** (equity thereby finances all assets).

Much ink has been spilled over the issue of whether opening or closing capital employed[1] or an average of the two figures should be used. We will leave it up to readers to decide for themselves. That said, you should take care not to change the method you decide to use as you go along, so that comparisons over longer periods are not skewed. The operating profit figure that should be used is the one we presented in Chapter 9, i.e. after employee profit-sharing, incentive payments and all the other revenues and charges that are assigned to the operating cycle.

These figures are calculated after tax. We calculate return on capital employed after tax using the normal rate and not by deducting the actual income tax as it depends on the financial structure, as financial interest is deductible and thereby reduces the taxes owed. For groups operating in

more than one country, the tax rate used is that found in the income statement by dividing corporate income tax by profit before tax.

Return on capital employed can be calculated by combining a margin and turnover rate as follows:

$$\frac{\text{Operating profit after tax}}{\text{Capital employed}} = \frac{\text{Operating profit after tax}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Capital employed}}$$

The first ratio on the right-hand side – operating profit after tax / sales – corresponds to the operating margin generated by the company, while the second – sales / capital employed – reflects asset turnover or capital turnover (the inverse of capital intensity), which indicates the amount of capital (capital employed) required to generate a given level of sales. Consequently, a “normal” return on capital employed may result from weak margins, but high asset turnover (and thus low capital intensity), e.g. in mass retailing. It may also stem from high margins, but low asset turnover (i.e. high capital intensity), e.g. satellite operator.

The following figure shows the ROCE and its components achieved by some leading groups during 2019.

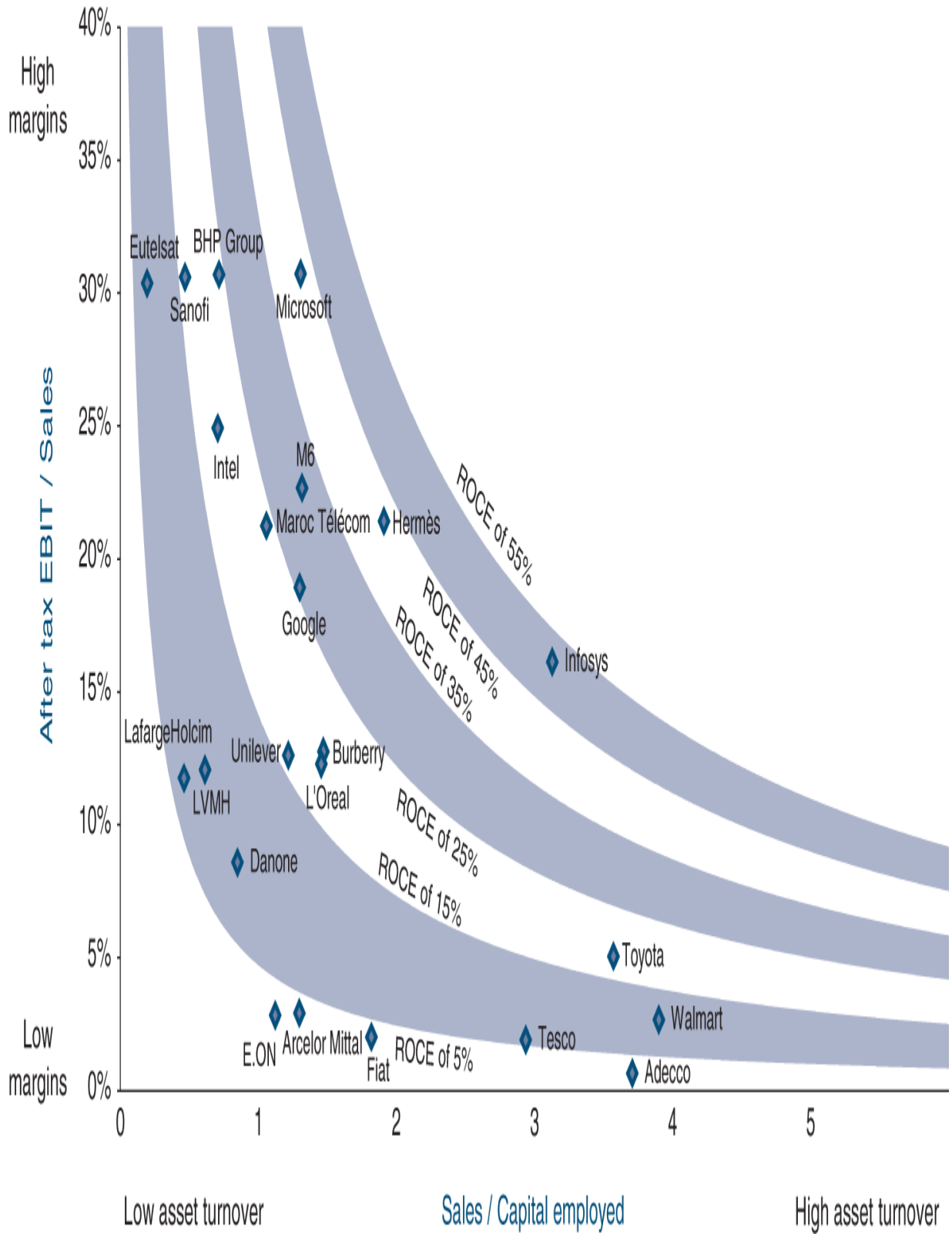
Walmart (food retail) and Eutelsat (satellite operator) generate a similar return on capital employed, but their operating margins and asset turnover are entirely different. Eutelsat has a strong operating margin but a weak asset turnover (high level of fixed assets), while Walmart has a smaller operating margin but a higher asset turnover (limited inventories, immediate cash collection from customers).

We can also calculate the return on equity (ROE), which is the ratio of net income to shareholders' equity:

$$\text{Return on equity} = \frac{\text{Net income}}{\text{Shareholders' equity}}$$

In practice, most financial analysts take goodwill impairment losses and non-recurring items out of net income before calculating return on equity.

Return on capital employed (ROCE) and its components in 2020

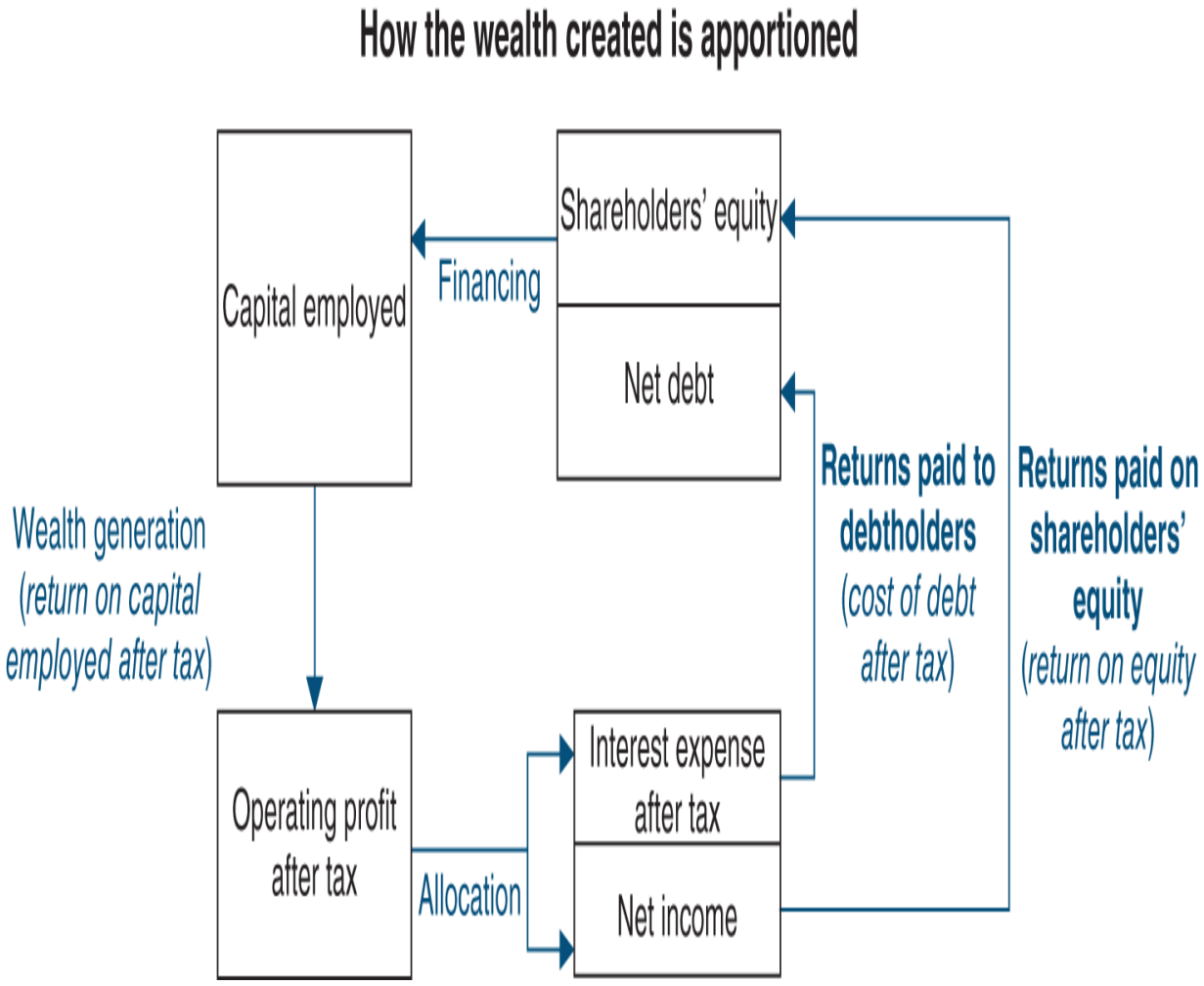


Section 13.2 LEVERAGE EFFECT

1/ THE PRINCIPLE

The leverage effect explains a company's return on equity in terms of its return on capital employed and cost of debt.

In our approach, we considered the total amount of capital employed, including both equity and debt. This capital is invested in assets that form the company's capital employed and that are intended to generate earnings, as follows:



All the capital provided by lenders and shareholders is used to finance **all the uses of funds, i.e. the company's capital employed**. These uses of funds generate operating profit, which itself is apportioned between net

financial expense (returns paid to debtholders) and net income attributable to shareholders.

If we compare a company's return on equity with its return on capital employed (after tax to remain consistent), we note that the difference is due only to its financial structure, apart from non-recurring items and items specific to consolidated accounts, which we will deal with later on.

> The leverage effect is the difference between return on equity and return on capital employed.

The leverage effect explains how it is possible for a company to deliver a return on equity exceeding the rate of return on all the capital invested in the business, i.e. its return on capital employed.

Readers should pause for a second to contemplate this corporate nirvana, which apparently consists in making more money than is actually generated by a company's industrial and commercial activities.

> But before getting too carried away, readers should note that the leverage effect works both ways. Although it can lift a company's return on equity above return on capital employed, it can also depress it, turning the dream into a nightmare.

The leverage effect works as follows. When a company raises debt and invests the funds it has borrowed in its industrial and commercial activities, it generates operating profit that normally exceeds the interest expense due on its borrowings. If this is not the case, it is not worth investing, as we shall see at the beginning of Section II of this book. So, the company generates a surplus consisting of the difference between the return on capital employed and the cost of debt related to the borrowing. This surplus is attributable to shareholders and increases return on equity. Hence the name leverage effect.

Let's consider a company with capital employed of 100, generating a return of 10% after tax, which is financed entirely by equity. Its return on capital employed and return on equity both stand at 10%.

If the same company finances 30 of its capital employed with debt at an interest rate of 4% after tax and the remainder with equity, its return on equity is:

Operating profit after tax:	10% × 100 = 10
− Interest expense after tax:	4% × 30 = 1.2
= Net income after tax:	= 8.8

When divided by shareholders' equity of 70 (100 – 30), this yields a return on equity after tax of 12.6% (8.8 / 70), while the after-tax return on capital employed stands at 10%.

The borrowing of 30 that is invested in capital employed generates operating profit after tax of 3, which, after post-tax interest expense (1.2), is fully attributable for an amount of 1.8 to shareholders. This surplus amount (1.8) is added to operating profit generated by the equity-financed investments (70 × 10% = 7) to give net income of 7 + 1.8 = 8.8. The company's return on equity now stands at 8.8 / 70 = 12.6%.

The leverage effect of debt thus increases the company's return on equity by 2.6%, or the surplus generated (1.8) divided by shareholders' equity (1.8 / 70 = 2.6).

Debt can thus be used to boost a company's return on equity without any change in return on capital employed.

But readers will surely have noticed the prerequisite for the return on equity to increase when the company raises additional debt, i.e. **its ROCE must be higher than its cost of debt**. Otherwise, the company borrows at a higher rate than the returns it generates by investing the borrowed funds in its capital employed. This gives rise to a deficit, which reduces the rate of return generated by the company's equity. Its earnings decline, and the return on equity **dips below** its return on capital employed.

Let's go back to our company and assume that its return on capital employed falls to 2% after tax. In this scenario, its return on equity is as

follows:

Operating profit after tax:	100 × 2% = 2
− Interest expense after tax:	30 × 4% = 1.2
= Net income after tax:	= 0.8

When divided by shareholders' equity of 70, this yields a return on equity after tax of 1.1% (0.8 / 70).

Once invested in tangible assets or working capital, the borrowing of 30 generates an operating profit after tax of 0.6 which, after deducting the 1.2 in interest charges, produces a deficit of 0.6 on the borrowed funds. This shortfall is thus deducted from net income, which will drop to 70 × 2% − 0.6 = 0.8.

The original return on capital employed of 2% is thus reduced by 0.6 / 70 = 0.9% to give a return on equity of 1.1% after tax.

When the return on capital employed falls below the cost of debt, the leverage effect of debt shifts into reverse and reduces the return on equity, which in turn falls below return on capital employed.

2/ FORMULATING AN EQUATION

Before we go any further, we need to clarify the impact of tax on this line of reasoning.

Tax reduces earnings. All revenues give rise to taxation and all charges serve to reduce the tax bite (provided that the company is profitable). Consequently, each line of the income statement can thus be regarded as giving rise to either tax expense or a theoretical tax credit, with the actual tax charge payable being the net amount of the tax expense and credits. We can thus calculate an operating profit figure net of tax, by simply multiplying the operating profit before tax by a factor of (1 – rate of corporate income tax).

As a result, we can ensure the consistency of our calculations. Throughout this chapter, we have **worked on an after-tax basis** for all the key profit indicators, i.e. operating profit, net financial expense and net income (note that our reasoning would have been identical had we worked on a pre-tax basis).

Let's now formulate an equation encapsulating our conclusions. Net income is equal to the return on capital employed multiplied by shareholders' equity plus a surplus (or deficit) arising on net debt, which is equal to the net debt multiplied by the difference between the after-tax return on capital employed and the after-tax cost of debt.

Translating this formula into a profitability rather than an earnings-based equation, we come up with the following:

$$\text{Return on equity} = \text{Return on capital employed (after tax)} + \left(\text{Return on capital employed (after tax)} - \text{After tax cost of debt}\right) \times \frac{\text{Net debt}}{\text{Shareholders' equity}}$$

Or

$$\text{ROE} = \text{ROCE} + (\text{ROCE} - i) \times \frac{D}{E}$$

> Readers should not let themselves get bogged down by this equation, which is based on an accounting tautology. The leverage effect is merely a straightforward factor that is used to account for return on equity, and nothing more.

The ratio of net debt to shareholders' equity is called financial leverage or gearing.

The leverage effect can thus be expressed as follows:

$$\frac{\text{Net debt}}{\text{Shareholders' equity}} \times (\text{Return on capital employed} - \text{After-tax cost of debt})$$

Return on equity is thus equal to the return on capital employed plus the leverage effect.

Note that:

the higher the company's return on capital employed relative to the cost of debt (e.g. if ROCE increases to 16% in our example, return on equity rises to 16% × 5.1% = 21.1%); or

the higher the company's debt burden, the higher the leverage effect.

Naturally, the leverage effect goes into reverse once:

return on capital employed falls below the cost of debt;

the cost of debt is poorly forecast or suddenly soars because the company's debt carries a variable rate and interest rates are on the rise.

The leverage effect applies even when a company has negative net debt, i.e. when its short-term financial investments exceed the value of its debt. In such cases, return on equity equates to the average of return on equity and return on net short-term investments weighted by shareholders' equity and net short-term investments. The leverage effect can thus be calculated in exactly the same way, with *i* corresponding instead to the after-tax rate of return on net short-term financial investments and *D* showing a negative value because net debt is negative.

For instance, let's consider the case of Hermès in 2020. Its shareholders' equity stood at €7,391m and its net debt was a negative €4,415m, while its short-term financial investments yielded 0.2% after tax. Its return on capital employed after applying an average tax rate of 31% stood at 48% based on its operating profit of €2,072m.[2] Return on equity thus stands at:

$$ROE = \frac{(2{,}072 + 0.2\% \times 4{,}415) \times (1 - 31\%)}{7{,}391}$$

$$= 48\% + (48\% - 0.2\%) \times \frac{-4{,}415}{7{,}391} = 19.4\%$$

The reason for Hermès ROE being lower than its ROCE is clearly not that the group's cost of debt is higher than its return on capital employed! To put things simply, Hermès is unable to secure returns on the financial markets for its surplus cash on a par with those generated by its manufacturing facilities. Consequently, it has to invest the funds at a rate below its return on capital employed, thus depressing its return on equity.

The following tables show trends in ROCE and ROE posted by various different sectors in Europe over the 2000–2022 period.

ROCE FOR LISTED GROUPS (EUROPEAN GROUPS PER SECTOR)

Sector	2005	2010	2015	2016	2017	2018	2019	2020	2021e	2022e
Aerospace & Defence	10%	9%	13%	16%	15%	17%	14%	5%	10%	14%
Automotive	7%	12%	10%	10%	11%	9%	8%	5%	9%	11%
Beverages	11%	10%	10%	7%	8%	8%	8%	6%	7%	8%
Building Materials	9%	5%	7%	8%	9%	8%	8%	8%	9%	10%
Business Services	11%	12%	11%	10%	11%	10%	9%	8%	9%	10%
Capital Goods	7%	14%	11%	11%	11%	11%	10%	8%	11%	13%
Chemicals	11%	11%	10%	9%	10%	8%	7%	7%	8%	9%
Consumer Goods	10%	13%	14%	11%	14%	13%	12%	10%	13%	13%
Food & HPC	15%	17%	14%	14%	14%	13%	14%	13%	14%	15%
Food Retail	8%	11%	9%	8%	9%	8%	7%	7%	7%	8%
General Retail	19%	22%	20%	20%	20%	19%	15%	7%	13%	16%
IT Hardware	32%	21%	15%	9%	15%	14%	13%	16%	17%	21%
IT Services	8%	16%	14%	15%	16%	12%	13%	9%	9%	11%

Sector	2005	2010	2015	2016	2017	2018	2019	2020	2021e	2022e
Leisure & Hotels	8%	9%	13%	12%	14%	12%	9%	–2%	1%	7%
Luxury Goods	10%	13%	12%	12%	14%	16%	12%	8%	11%	13%
Media	9%	10%	10%	9%	9%	9%	8%	6%	7%	9%
Medtech & Services	9%	10%	9%	9%	10%	9%	7%	6%	8%	8%
Mining	19%	19%	3%	6%	10%	10%	9%	12%	16%	13%
Oil & Gas	20%	10%	2%	2%	6%	9%	6%	3%	5%	8%
Paper & Packaging	8%	6%	8%	8%	10%	11%	8%	7%	7%	8%
Software	53%	24%	16%	15%	18%	14%	12%	12%	11%	13%
Steel	12%	4%	3%	5%	7%	8%	2%	–3%	6%	7%
Telecom Operators	9%	9%	6%	6%	7%	7%	6%	5%	6%	6%
Transport & Infrastructure	8%	8%	9%	8%	9%	8%	7%	0%	5%	7%
Utilities	8%	6%	5%	5%	5%	5%	5%	5%	5%	5%

Source: Exane BNP Paribas

The reader may notice that high rates of ROCE cannot be maintained indefinitely, as can be seen in the oil and mining sectors. We'll be looking at this again in Chapter 26.

In 2020, the utilities and luxury sectors had identical returns on equity (10%), but different ROCE (5% and 8% respectively). Debt explains this difference: reasonable in the luxury sector, much higher in the utilities sector (see Section 12.2). The quality of return on equity in the luxury sector is therefore better than for utilities as it is more efficient operationally.

ROE FOR LISTED GROUPS (EUROPEAN GROUPS PER SECTOR)

Sector	2005	2010	2015	2016	2017	2018	2019	2020	2021e	2022e

Sector	2005	2010	2015	2016	2017	2018	2019	2020	2021e	2022e
Aerospace & Defence	12%	11%	22%	21%	16%	21%	19%	6%	17%	21%
Automotive	13%	12%	12%	12%	14%	12%	10%	4%	11%	13%
Beverages	16%	15%	17%	10%	13%	15%	13%	10%	12%	12%
Building Materials	14%	6%	9%	10%	12%	12%	12%	11%	12%	13%
Business Services	21%	21%	23%	23%	21%	21%	20%	15%	18%	18%
Capital Goods	9%	17%	14%	15%	15%	20%	14%	11%	14%	16%
Chemicals	18%	18%	16%	14%	16%	12%	10%	10%	13%	14%
Consumer Goods	14%	14%	14%	15%	19%	18%	16%	14%	15%	15%
Food & HPC	20%	19%	18%	18%	19%	20%	21%	20%	20%	21%
Food Retail	13%	13%	8%	8%	8%	9%	9%	7%	7%	8%
General Retail	21%	21%	19%	19%	18%	18%	18%	8%	14%	18%
IT Hardware	20%	12%	12%	6%	13%	10%	13%	15%	15%	17%
IT Services	12%	15%	16%	15%	17%	16%	15%	11%	11%	12%
Leisure & Hotels	10%	13%	18%	18%	21%	16%	15%	–8%	–1%	12%
Luxury Goods	12%	14%	14%	13%	16%	17%	17%	10%	15%	16%
Media	14%	15%	14%	13%	14%	14%	15%	12%	13%	15%
Medtech & Services	13%	13%	14%	13%	14%	11%	11%	9%	11%	11%
Mining	30%	25%	5%	9%	14%	15%	14%	18%	22%	17%
Oil & Gas	25%	15%	6%	4%	8%	11%	9%	1%	7%	11%
Paper & Packaging	17%	7%	12%	11%	12%	15%	12%	9%	10%	10%

Sector	2005	2010	2015	2016	2017	2018	2019	2020	2021e	2022e
Software	38%	28%	19%	18%	19%	16%	16%	17%	14%	15%
Steel	20%	6%	–5%	5%	10%	11%	0%	–10%	6%	6%
Telecom Operators	14%	14%	8%	9%	11%	9%	9%	10%	9%	9%
Transport & Infrastructure	18%	14%	14%	15%	15%	13%	13%	–9%	9%	15%
Utilities	15%	11%	11%	10%	10%	10%	10%	10%	10%	11%

Source: Exane BNP Paribas

3/ CALCULATING THE LEVERAGE EFFECT

(a) Presentation

To calculate the leverage effect and the return on equity, we recommend using the following table. The items needed for these calculations are listed below. We strongly recommend that readers use the data shown in the tables in Section 4.2, 5/ and Section 9.3.

On the income statement:

sales (*S*);

profit before tax and non-recurring items (*PBT*);

financial expense net of financial income (*FE*);

operating profit (*EBIT*).

On the balance sheet:

fixed assets (*FA*);

working capital (*WC*) comprising both operating and non-operating working capital;

capital employed, i.e. the sum of the two previous lines, alternatively the sum of the two following lines, since capital employed is financed by shareholders' equity and debt (*CE*);

shareholders' equity (*E*);

net debt encompassing all short-, medium- and long-term bank borrowings and debt less marketable securities, cash and equivalents (*D*).

LEVERAGE EFFECT (E.G. ARCELORMITTAL)

Basic data ($m)	**2016**	**2017**	**2018**	**2019**	**2020**
Sales (*S*)	56,791	68,679	76,033	70,615	53,270
Profit before tax and non-recurring	2,925	5,007	4,981	(5)	(505)
+ Financial expense net of financial	2,056	875	2,210	1,554	1,190
= Operating profit (*EBIT*)	4,981	5,882	7,191	1,549	685
Fixed assets (*FA*)	47,317	51,676	52,598	49,485	45,398
+ Working capital (*WC*)	5,764	7,605	7,688	4,646	2,805
= CAPITAL EMPLOYED (*CE*)	53,081	59,281	60,286	54,131	48,203
Shareholders' equity (*E*)	29,017	36,485	38,195	34,134	34,203
+ (restated) Net debt (*D*)	24,064	22,796	22,091	19,997	14,000
= CAPITAL INVESTED = CAPITAL	53,081	59,281	60,286	54,131	48,203
Corporate income tax (T_c)*	25.0%	28.0%	26.0%	25.0%	25.0%

* In practice, the analyst may prefer to use the actual rate based on the average taxation for the firm.

CALCULATIONS

	After tax cost of debt	6.4%	2.8%	7.4%	5.8%	6.4%

	$= \frac{FE \times (1 - T_c)}{D}$					
ROCE	Return on capital employed (after tax) $= \frac{EBIT \times (1 - T_c) \text{ or } NOPAT}{CE}$	7.0%	7.1%	8.8%	2.1%	1.1%
ROCE – i	Return on capital employed (after tax) – after-tax cost of debt	0.6%	4.4%	1.4%	– 3.7%	– 5.3%
D / *E*	Gearing	0.8	0.6	0.6	0.6	0.4
	$\text{Leverage effect} = (ROCE - i) \times \frac{D}{E}$	0.5%	2.7%	0.8%	– 2.2%	– 2.2%
ROE	$= \frac{PBT \times (1 - T_c)}{E}$	7.6%	9.9%	9.7%	0.0%	– 1.1%
	or					
ROE	$ROE = ROCE + (ROCE - i) \times \frac{D}{E}$	7.6%	9.9%	9.7%	0.0%	– 1.1%

RESULTS

Returns	**2016**	**2017**	**2018**	**2019**	**2020**
After tax operating margin (*EBIT* / *S* × (1 – T_c))	6.6%	6.2%	7.0%	1.6%	1.0%
× Capital employed turnover (*S* / *CE*)	1.1	1.2	1.3	1.3	1.1
= Return on capital employed (*A*)	7.0%	7.1%	8.8%	2.1%	1.1%
Return on capital employed – after-tax cost of debt (*ROCE – i*)	0.6%	4.4%	1.4%	– 3.7%	– 5.3%
× Gearing (*D*/*E*)	0.8	0.6	0.6	0.6	0.4
= Leverage effect (*B*)	0.5%	2.7%	0.8%	– 2.2%	– 2.2%
Return on equity (*A* + *B*)	7.6%	9.9%	9.7%	0.0%	– 1.1%

(b) Practical problems

We recommend that readers use the balance sheets and income statements prepared during Chapters 4 and 9 as a starting point when filling in the previous table.

> We cannot overemphasise the importance of the two following accounting equations:
>
> $$\text{Capital employed} = \text{shareholders' equity} + \text{net debt}$$
>
> Operating profit after tax = net income from current operations + net financial expense after tax.

Consequently, readers will arrive at the same return on equity figure whichever way they calculate it. It is worth remembering that using profit before tax and non-recurring items rather than net income eliminates the impact of non-recurring items.

Besides breaking down quasi-equity between debt and shareholders' equity, provisions between working capital and debt, etc., which we dealt with in Chapter 7, only three concrete problems arise when we calculate the leverage effect in consolidated financial statements.

The way goodwill is treated (see Chapter 6) has a significant impact on the results obtained. Setting off entire amounts of goodwill against shareholders' equity as a result of impairment tests or amortisation causes a large chunk of capital employed and shareholders' equity to disappear from the balance sheet. As a result, the nominal returns on equity and on capital employed may look deceptively high when this type of merger accounting is used. Just because whole chunks of capital appear to have vanished into thin air from a balance sheet perspective does not mean that shareholders will give up their normal rate of return requirements on the capital that has done a perfectly legitimate disappearing act under accounting standards.

Consequently, we recommend that readers should, wherever possible, work with **gross** goodwill figures and add back to shareholders' equity the difference between gross and net goodwill to keep the balance sheet in

equilibrium. Likewise, we would advise working on the basis of operating profit and net profit before goodwill amortisation or impairment losses.

The same reasoning could be applied to equity erased by losses carried forward. They obviously do not correspond to a portion of equity recovered by shareholders even if it is no longer in the balance sheet. In an ideal world, the analyst should correct the book equity of losses carried forward in the past. This is rarely done as the information is not always easily accessible.

Consolidated accounts present another problem, which is how **income from associates**[3] **should be treated**. Should income from associates be considered as financial income or as a component of operating profit, bearing in mind that the latter approach implies adding an income after financial expense and tax to an operating profit (which is before tax)?

The rationale for considering income from associates as financial income is that it equals the dividend that the group would receive if the associate company paid out 100% of its earnings. This first approach seems to fit a financial group that may sell one or another investment to reduce its debt.

The rationale for considering income from associates as part of the operating profit is that income from associates derives from investments included in capital employed. This latter approach is geared more to an industrial group, for which such situations should be exceptional and temporary because the majority of industrial groups intend to control more than 50% of their subsidiaries. In this case, the amount is included in capital employed. This is the approach we used for ArcelorMittal.

Finally, for those wondering whether **return on equity** should be the return on overall equity or just the return on group share of equity, we recommend a global approach in order to tie in with capital employed, which covers all capital employed and not just group share thereof.

4/ COMPANIES WITH NEGATIVE CAPITAL EMPLOYED

Companies with negative capital employed usually have high negative working capital exceeding the size of their net fixed assets. This phenomenon is prevalent in certain specific sectors (contract catering, food

retailing, etc.) and this type of company typically posts a very high return on equity.

> Of the two roles played by shareholders' equity, i.e. financing capital expenditure and acting as a guarantee for lenders, the former is not required by companies with negative capital employed. Only the latter role remains.

Consequently, return on capital employed needs to be calculated taking into account income from short-term financial investments (included in earnings) and the size of these investments (included in capital employed):

$$\text{ROCE} = \frac{(\text{EBIT} + \text{Financial income}) \times (1 - T_c)}{\text{Capital employed} + \text{Short-term financial investments}}$$

As a matter of fact, companies in this situation factor their financial income into the selling price of their products and services. Consequently, it would not make sense to calculate capital employed without taking short-term financial investments into account.

Section 13.3 USES AND LIMITATIONS OF THE LEVERAGE EFFECT

1/ LIMITATIONS OF BOOK PROFITABILITY INDICATORS

Book-based return on capital employed figures are naturally of great interest to financial analysts and managers alike. That said, they have much more limited appeal from a financial standpoint. The leverage effect equation always stands up to analysis, although sometimes some anomalous results are produced. For instance, the cost of debt calculated as the ratio of financial expense net of financial income to balance sheet debt may be plainly too high or too low. This simply means that the net debt shown on the balance sheet does not reflect average debt over the year, that the company is in reality much more (or less) indebted, or that its debt is subject to seasonal fluctuations, or a financial transaction (i.e. capital increase) was carried out during the year.

Attempts may be made to overcome this type of problem by using average or restated figures, particularly for fixed assets and shareholders' equity. But this approach is really feasible only for internal analysts with sufficient data at their disposal.

> It is thus important not to set too much store by implicit interest rates or the corresponding leverage effect when they are clearly anomalous.

For managers of a business or a profit centre, return on capital employed is one of the key performance and profitability indicators, particularly with the emergence of economic profit indicators, which compare the return on capital employed with the weighted average cost of capital (see Chapter 27). It is also often used in the calculation of variable compensation as an important performance metric.

From a financial standpoint, however, book-based returns on capital employed and returns on equity hold very limited appeal. Since book returns are prepared from the accounts, they do not reflect risks. As such, book returns should not be used in isolation as an objective for the company because this will prompt managers to take extremely unwise decisions.

As we have seen, it is easy to boost book returns on equity by gearing up the balance sheet and harnessing the leverage effect. The risk of the company is also increased without being reflected in the accounting-based formula.

> Return on capital employed and return on equity are accounting indicators used for historical analysis. In no circumstances whatsoever should they be used to project the future rates of return required by shareholders or all providers of funds.

If a company's book profitability is very high, shareholders require a lot less and will already have adjusted their valuation of shareholders' equity, whose market value is thus much higher than its book value. If a company's book profitability is very low, shareholders want much more and will already have marked down the market value of shareholders' equity to well below its book value.[4]

It is therefore essential to note that the book return on equity, return on capital employed and cost of debt do not reflect the rates of return required by shareholders, providers of funds or creditors, respectively. These returns cannot be considered as financial performance indicators because they do not take into account the two key concepts of risk and valuation. Instead, they belong to the domains of financial analysis and control.

2/ USES OF THE LEVERAGE EFFECT

Characteristic of the 1960s, or today with Tesla and its electric cars in the automotive industry, a strategy of “forging ahead regardless” is particularly well suited to periods of strong growth. This is a two-pronged strategy – high levels of capital expenditure in order to increase the size of industrial facilities, and low margins in order to win market share and ensure that industrial facilities are fully utilised. Obviously, return on capital employed is low (low margins and high capex), but the inevitable use of debt (the low margins lead to cash flows insufficient to finance the high capex) makes it possible to swell the return on equity through the leverage effect. Moreover, the real cost of debt is low or negative because of inflation. However, return on equity is very unstable and it may decline suddenly when the growth rate of the activity slows down. This was the strategy of Suntech, the Chinese

world leader in solar panels, which enabled it to take a lion's share of its market – or as a consultant would put it, to move down its experience curve – but which was also the source of its collapse in 2013.

The leverage effect sheds light on the origins of return on equity, i.e. whether it flows from operating performance (i.e. a good return on capital employed) or from a favourable financing structure harnessing the leverage effect. Our experience tells us that, **in the long term, only an increasing return on capital employed guarantees a steady rise in a company's return on equity**.

> The main point of the leverage effect is to show how return on equity breaks down between the profitability of a company's industrial and commercial operations and its capital structure (i.e. the leverage effect).

As we shall see in Section IV, the leverage effect is not very useful in finance because it does not create any value except in two very special cases:

in times of rising inflation, real interest rates (i.e. after inflation) are negative, thereby eroding the wealth of a company's creditors who are repaid in a lender's depreciating currency to the great benefit of the shareholders;

when companies have a very heavy debt burden (e.g. following a leveraged buyout, see Chapter 47), which obliges management to ensure that they perform well so that the cash flows generated are sufficient to cover the heavy debt servicing costs. In this type of situation, the leverage effect gives management a very strong incentive to do well, because the price of failure would be very high.

Section 13.4 CASE STUDY: ARCELORMITTAL

ArcelorMittal's economic profitability is typical of a cyclical company, alternating between highs and lows: it was close to 0% in 2015 before recovering significantly between 2016 and 2018 (7% – 9%), then falling in 2019 to 2%, and 1% in 2020. These developments are largely the result of the earnings profile we saw earlier with, in particular, the significant cost reduction plan undertaken in 2016, but also of a very buoyant market in 2018. Indeed, the economic rotation remains stable at around 1.2, which seems to be a sustainable characteristic of this capital-intensive sector.

Given the leverage effect of debt, variations in ArcelorMittal's return on equity multiply those in economic profitability. In 2015, 2019 and 2020, the latter being close to zero, leads to a negative or zero return on equity. From 2016 to 2018, the return on equity slightly exceeds the economic profitability because of a relatively high cost of debt, the residue of difficult years before 2015. ArcelorMittal's continued deleveraging makes a very high leverage unlikely in the future, which is fine in this sector with high fixed costs, no growth overall and alternating economic phases.

SUMMARY

The summary of this chapter can be downloaded from www.vernimmen.com.

Return on capital employed is the book return generated by a company's operations. It is calculated as operating profit after normalised tax divided by capital employed or as the NOPAT margin multiplied by asset turnover (sales / capital employed). Return on equity is the ratio of net profit to shareholders' equity.

The leverage effect of debt is the difference between return on equity and return on capital employed. It derives from the difference between return on capital employed and the after-tax cost of debt and is influenced by the relative size of debt and equity on the balance sheet. From a mathematical standpoint, the leverage effect leads to the following accounting tautology:

$$\text{ROE} = \text{ROCE} + (\text{ROCE} - i) \times \frac{D}{E}$$

The leverage effect works both ways. Although it may boost return on equity to above the level of return on capital employed, it may also dilute it to a weaker level when the return on capital employed falls below the cost of debt.

Book return on capital employed, return on equity and cost of debt do not reflect the returns required by shareholders, providers of funds and creditors. These figures cannot be regarded as financial indicators because they do not take into account risk or valuation, two key parameters in finance. Instead, they reflect the historical book returns achieved and belong to the realms of financial analysis and control.

The leverage effect helps to identify the source of a good return on equity, which may come from either a healthy return on capital employed or merely from a company's capital structure, i.e. the leverage effect. This is its only real point.

In the long run, only a healthy return on capital employed will ensure a decent return on equity. As we shall see, the leverage effect does not

create any value. Although it may boost return on equity, it leads inevitably to an increase in the risk of equity.

QUESTIONS

1/Why is capital employed equal to invested capital?

2/What is the leverage effect?

3/How is the leverage effect calculated?

4/Why is the leverage effect equation an accounting tautology?

5/According to the leverage effect equation, for the same after-tax ROCE of 10%, an increase in debt (costing 4% after tax) could improve the return on equity. State your views.

6/Why is goodwill a problem when calculating ROCE?

7/What is the basic purpose of the leverage effect?

8/Your financial director suggests that you increase debt to increase ROE. State your views.

9/What is the main problem with accounting profitability indicators such as ROE and ROCE?

10/Over a given period, interest rates are low, corporation tax rates are high and the economy is doing well. What consequences will this have on the financial structure of companies?

11/How would you view a sector with high margins and low capital intensity?

12/How would you view a sector with low margins and high capital intensity?

13/Can you name two very different types of companies with a ROCE higher than their return on equity? Which one is riskier?

14/Can you name two very different types of companies with a ROCE equal to their return on equity? Which one is riskier?

You'll find more questions at www.vernimmen.com.

EXERCISES

1/A businessman is hoping to get a 20% return on equity after tax. The business generates a 3% sales margin (after tax). Provide two possible combinations of financial structure, profitability and capital employed that could lead to the generation of a 20% return on equity (the cost of borrowing is 5% before tax, the tax rate is 40% and the company's capital employed is 1,000).

2/Calculate the leverage effect for each year. What are your conclusions?

Millions of €	**1**	**2**	**3**	**4**	**5**
Shareholders' equity	100	115	320	300	240
Long- and medium-term debt	123	180	540	640	680
Financial expense before tax	11	18.5	29	63	83
Net income	14	16	(20)	(60)	(40)
Tax rate	35%	35%	35%	35%	35%

3/Calculate the ROCE and the ROE of L'Oréal and Carlsberg for 2020. You should include retirement benefits in the net debt and other long-term liabilities in working capital. There has been no amortisation or impairment of goodwill. The income tax rate is 25% for L'Oréal and 24% for Carlsberg. You should consider that, for L'Oréal, equity affiliates and participating interests correspond to a 9.4% financial interest in Sanofi, and for Carlsberg they correspond to minority interests in various beer businesses.

2020	**L'Oréal (in € bn)**	**Carlsberg (in DKR bn)**
NET SALES	**28.0**	**58.5**
− Cost of sales	(7.5)	(30.1)
= GROSS MARGIN	**20.5**	**28.4**
− Selling and marketing costs	(8.7)	(15.4)
− General and administrative costs	(5.6)	(3.5)
− R&D costs	(1.0)	-
± Other operating income and expense	(0.7)	(0.2)
+ Income from associates	0.4	0.3
= **RECURRING OPERATING PROFIT**	**4.9**	**9.6**
± Non-recurring items	-	(0.2)
= **OPERATING PROFIT**	**4.9**	**9.4**
− Financial expense	(0.1)	(0.8)
+ Financial income	-	0.4
= PROFIT BEFORE TAX	**4.8**	**9.0**
− Income tax	(1.2)	(2.2)
− Minority interests	-	(0.8)
NET PROFIT ATTRIBUTABLE TO SHAREHOLDERS	**3.6**	**6.0**
	L'Oréal	**Carlsberg**
Goodwill	10.5	53.1

2020	L'Oréal (in € bn)	Carlsberg (in DKR bn)
Other intangible fixed assets	3.4	12.9
Tangible fixed assets	3.2	26.3
Equity in associated companies and financial stakes	9.6	4.2
Other non-current assets	-	3.3
NON-CURRENT ASSETS (FIXED ASSETS)	**26.7**	**99.8**
Inventories	2.7	4.6
Trade receivables	3.5	3.7
Other operating receivables	2.0	2.6
Trade payables	(4.8)	(16.6)
Other operating payables	(5.1)	(17.1)
OPERATING WORKING CAPITAL (1)	(1.7)	(22.8)
NON-OPERATING WORKING CAPITAL (2)	0.0	0.0
WORKING CAPITAL (1 + 2)	**(1.7)**	**(22.8)**
SHAREHOLDERS' EQUITY GROUP SHARE	**29.2**	**39.3**
Minority interests in consolidated subsidiaries	-	**4.1**
Retirement benefits	1.0	2.9
Other long-term liabilities	0.3	8.5
Medium- and long-term borrowings and liabilities	-	29.3
Bank overdrafts and short-term borrowings	0.9	1.0

2020	L'Oréal (in € bn)	Carlsberg (in DKR bn)
Cash and equivalents	6.4	8.1
NET DEBT	**(4.2)**	**33.6**

4/What do you think of A, B and C group performances?

RETURN ON EQUITY (%)

	2016	2017	2018	2019
Group A	15	16	18	20
Group B	15	15	15	15
Group C	40	40	40	40

RETURN ON CAPITAL EMPLOYED (AFTER TAX) (%)

	2016	2017	2018	2019
Group A	10	8	7	7
Group B	15	15	15	15
Group C	10	10	10	10

5/Prove the leverage effect equation.

ANSWERS

Questions

1/*Because accounts are balanced!*

2/*The difference between return on equity and ROCE after tax.*

3/*Leverage effect = (ROCE – after-tax cost of debt) × debt/equity, or ROE – ROCE.*

4/*As it is based on total assets being exactly equal to total liabilities and equity.*

5/*That is true but it also increases the risk to the shareholder.*

6/*Because if it had been impaired, reducing capital employed (see Section 6.2, 2/), it would have artificially increased book returns. Our advice is to look at the gross rather than the net figures (before impairment losses on this goodwill).*

7/*It helps to identify the source of a good return on equity, a good ROCE, or significant leverage.*

8/*Is ROCE higher than the cost of debt? What is the risk for shareholders?*

9/*They do not factor in risk.*

10/*An increase in the leverage effect. However, see Section III of this book.*

11/*It's like nirvana, high margins and low capex will generate high returns. New entrants will try to enter this sector and this will most likely reduce margins in the medium term.*

12/*The sector needs to be restructured as it is not viable as such: very low profitability, which pleases no one and leads to waste at a macroeconomic level and the firms in the sector bear high leverage bankruptcies.*

13/*A company with negative net debt that invests its cash balances at an interest rate lower than its ROCE. A company in debt at an interest rate higher than its (low) ROCE. The second, which is in debt and has a low ROCE.*

14/*A company with zero debt. A company in debt at an interest rate equal to its (low) ROCE. The second one as it is in debt and has a low ROCE.*

Exercises

A detailed Excel version of the solutions is available at www.vernimmen.com.

1/*Using the leverage effect equation the following can be determined:*

	Solution 1	Solution 2
Capital employed	1,000	1,000
Net borrowings	750	0
Shareholders' equity	250	1,000
Sales	1,666.7	6,666.7
Operating profit	120.8	333
Financial expense	37.5	0
Corporate income tax	33.3	133
Net income	50	200

2/

	1	2	3	4	5
ROCE after tax	9.5%	9.5%	0.7%	0.2%	3.0%
Leverage	1.23	1.57	1.69	2.13	2.83
Net cost of debt*	5.8%	6.7%	4.8%	9.7%	10.0%
Leverage effect	4.5%	4.4%	−6.9%	−20.2%	−19.7%
ROE	14%	13.9%	−6.2%	−20%	−16.7%

*Tax savings have only had a partial impact in the last three years.

When ROCE is above the after-tax cost of debt, debt boosts ROE. It depresses it when ROCE is lower than the after-tax cost of debt. This company is on the verge of bankruptcy.

3/*There is no one right answer. However, it is important to be consistent when calculating. Special attention should be paid when calculating ROCE:*

Our advice is to take operating income before non-recurring items.

If capital employed includes long-term investments and investments in associates, operating income should be restated to include income on these assets. Here, operating profit includes income from associates, therefore to be consistent capital employed should include equity in associated companies. In any case, in our example, and given the small amounts, the difference between the ways of calculating would not be material.

What tax rate to use? Marginal tax rate or actual tax rate? We tend to use actual tax rate, in particular for international groups which pay tax in different jurisdictions. But here again the key is to be consistent.

	L'Oréal	**Carlsberg**
Capital employed	26.7 – 1.7 = 25.0	99.8 – 22.8 = 77
Operating income	4.9 – 0.4 = 4.5	9.4
Tax at 25% and 24%, respectively	4.5 × 25% = 1.1	9.4 × 24% = 2.3
Return on capital employed after tax	(4.5 – 1.1) / (25.0 – 9.6) = 21.9%	(9.4 – 2.3) / 77 = 9.5%
Shareholders' equity	29.2 + 0.0 = 29.2	39.3+4.1 = 43.4
Net earnings	4.8 × (1 – 25%) = 3.6	9.0 × (1 – 24%) = 6.8
Return on equity	3.6 / 29.2 = 12.3%	6.8 / 43.4 = 15.8%

Carlsberg has a ROCE (9.5%) probably above its cost of capital and a ROE of 15.8% thanks to the leverage their reliance on debt creates.

L'Oréal has an excellent ROCE of more than 22%. The leverage effect is negative given a net debt level below 0 and their minority interest in Sanofi.

4/*A superficial analysis may suggest that group C is a star performer owing to its stunningly high return on equity (40%), that group A is improving and that group B is rather disappointing by comparison.*

But this analysis does not even scratch the surface of the reality! Group C generates its very high returns through the unbridled use of the leverage effect that weakens the whole company, while its return on capital employed is average. Group B has no debt and carries the least risk, while its return on capital employed is the highest. Group A's improvement is merely a mirage because it is attributable entirely to a stronger and stronger leverage effect while its return on capital employed is steadily declining, so group A is actually exposed to the greatest risks.

5/*Where:*

$$\begin{aligned} \text{NI} &= \text{Net income} \\ \text{EBIT} &= \text{Operating profit} \\ T_c &= \text{Tax rate} \\ i &= \text{After-tax cost of debt} \end{aligned}$$

$$\begin{aligned} \text{ROE} = \frac{\text{NI}}{E} &= \frac{\text{EBIT} \times (1 - T_c) - i \times D}{E} = \frac{\text{EBIT} \times (1 - T_c)}{E} - \frac{i \times D}{E} \\ &= \frac{\text{EBIT} \times (1 - T_c) \times (E + D)}{E \times (E + D)} - \frac{i \times D}{E} \\ &= \frac{\text{EBIT} \times (1 - T_c)}{E + D} + \frac{\text{EBIT} \times (1 - T_c)}{E + D} \times \frac{D}{E} - i \times \frac{D}{E} \end{aligned}$$

$$\text{whereas} \text{ROCE} = \frac{\text{EBIT} \times (1 - T_c)}{E + D} \text{ and so } \text{ROC} = \text{ROCE} + (\text{ROCE} - i) \times \frac{D}{E}$$

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Find corporate income tax rates at:

www.kpmg.com/global/en/services/tax/tax-tools-and-resources/pages/corporate-tax-rates-table.aspx

NOTES

1 *Depending on whether capital expenditure during the period is regarded as having contributed to wealth creation or not.*

2 *2,098 × (1 − 35%)/(5,508 –3,227) = 59.8%.*

3 *For more on income from associates, see Section 6.1, 2/.*

4 *For more on this point, see Chapter 26.*

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Chapter 14
CONCLUSION OF FINANCIAL ANALYSIS

As one journey ends, another probably starts

By the time you complete a financial analysis, you must be able to answer the following two questions that served as the starting point for your investigations:

Will the company be solvent? That is, will it be able to repay any loans it raised?

Will it generate a higher rate of return than that required by those that have provided it with funds? That is, will it be able to create value?

Value creation and solvency are obviously not without links. A firm that creates value will most often be solvent and a company will most likely be insolvent because it has not succeeded in creating value.

Section 14.1 SOLVENCY

Here we return to the concept that we first introduced in Chapter 4.

> A company is solvent when it is able to honour all its commitments by liquidating all of its assets, i.e. if it ceases its operations and puts all its assets up for sale.

Since, by definition, a company does not undertake to repay its shareholders, its equity represents a kind of life raft that will help keep it above water in the event of liquidation by absorbing any capital losses on assets and extraordinary losses.

> Solvency thus depends on:
>
> the break-up value of a company's assets;
>
> the size of its debts.

Do assets have a value that is independent of a company's operations? The answer is probably “yes” for the showroom of a carmaker on 5th Avenue in New York and probably “no” as far as the tools and equipment at a heavy engineering plant are concerned.

Is there a secondary market for such assets? Here, the answer is affirmative for the fleet of cars owned by a car rental company, but probably negative for the technical installations of a foundry. To put things another way, will a company's assets fetch their book value or less? The second of these situations is the most common. It implies capital losses on top of liquidation costs (redundancy costs, etc.) that will eat into shareholders' equity and frequently push it into negative territory. In this case, lenders will be able to lay their hands on only a portion of what they are owed. As a result, they suffer a capital loss.

The solvency of a company thus depends on the level of shareholders' equity restated from a liquidation standpoint relative to the company's commitments and the nature of its business risks.

If a company posts a loss, its solvency deteriorates significantly owing to the resulting reduction in shareholders' equity and cumulative effects.

A loss-making company no longer benefits from the tax shield provided by debt.[1] As a result, it has to bear the full brunt of financial expense, which thus makes losses even deeper. Very frequently, companies raise additional debt to offset the decrease in their equity. Additional debt then increases financial expense and exacerbates losses, giving rise to the cumulative effects we referred to above.

Let's consider a company with debt equal to its shareholders' equity. The market value of its debt and shareholders' equity is equal to their book value because its return on capital employed is the same as its cost of capital of 10%.

As a result of a crisis, the return on capital employed declines, leading to the following situation:

Year	**0**	**1**	**2**	**3**	**4**	**5**
Book value of capital employed = Book value of equity + Net debt (costing 6%)	100 = 50 +50	100 = 50 +50	100 = 47 +53	100 = 34 +66	100 = 25 +75	100 = 25 +75
Return on capital employed	10%	0%	−10%	−5%	5%	10%
Operating profit after tax − After-tax interest expense (tax rate of 35%) = Net income[2]	10 −2 = 8	0 −3 = − 3	−10 −5 = − 13	−5 −4 = − 9	5 −5 = 0	10 −5 = 5
Market value of capital employed[3] = Market value of equity + Market value of net debt	100 = 50 +50	85 = 38 +47	55 = 15 +40	68 = 18 +50	85 = 25 +60	100 = 30 +70

The company's evolution does not come as a surprise. The market value of capital employed falls by 45% at its lowest point because the previously normal return on capital employed turns negative. The market value of debt

declines (from 100% to 75% of its nominal value) since the risk of non-repayment increases with the decline in return on capital employed and the growing size of its debt. Lastly, the market value of shareholders' equity collapses (by 70%).

Each year, the company has to increase its debt to cover the loss recorded in the previous year, to keep its capital employed at the same level. From 1 at the start of our model, financial gearing soars to 3 by the end of year 5. In this scenario, its equity gets smaller and smaller, and its lenders will be very lucky to get their hands on the original amounts that they invested. This scenario shows how debt can spiral in the event of a crisis! Some restructuring of equity and liabilities or, worse still, bankruptcy is bound to ensue with the additional losses caused by the disruption.

Imagine a second company with the same operating characteristics as the first one but debt-free when the crisis began. Its financial performance would have been entirely different, as shown by the following table:

Year	**0**	**1**	**2**	**3**	**4**	**5**
Book value of capital employed = Book value of equity + Net debt	100 = 100 +0	100 = 100 +0	100 = 100 +0	100 = 90 +10	100 = 84 +16	100 = 84 +16
Return on capital employed	10%	0%	−10%	−5%	5%	10%
Operating profit after tax − After-tax interest expense (tax rate of 35%) = Net income[4]	10 −0 = 10	0 −0 = 0	−10 −0 = −10	−5 −1 = −6	5 −1 = 4	10 −1 = 9
Market value of capital employed[5] = Market value of equity + Market value of net debt	100 = 100 +0	85 = 85 +0	55 = 55 +0	68 = 58 +10	84 = 68 +16	100 = 84 +16

At the end of year 4, the second company returns to profit and its shareholders' equity has been dented only moderately by the crisis.

Consequently, the first company, which is comparable to the second in all respects from an economic perspective, will not be able to secure financing

and is thus probably doomed to failure as an independent economic entity. This was the case for Hertz or Orchestra in 2020.

For a long time, **net assets**, i.e. the difference between assets and total liabilities or assets net of debt, was the focal point for financial analysis. Net assets are thus an indicator that corresponds to shareholders' equity and are analysed in comparison to the company's total commitments.

Some financial analysts calculate net assets by subtracting goodwill (or even all intangible fixed assets), adding back unrealised capital gains (which may not be accounted for owing to the conservatism principle), with inventories possibly being valued at their replacement cost.

Broadly speaking, calculating net assets is an even trickier task with consolidated accounts owing to minority interests (which group assets do they own?) and goodwill (what assets does it relate to and what value, if any, does it have?). Consequently, we recommend that readers should work using the individual accounts of the various entities forming the group and then consolidate the net asset figures using the proportional method.

Section 14.2 VALUE CREATION

A company will be able to create value during a given period if the return on capital employed (after tax) that it generates exceeds the cost of the capital (i.e. equity and net debt) that it has raised to finance capital employed.

Readers will have to remain patient for a little while yet because we still have to explain how the rate of return required by shareholders and lenders (called weighted average cost of capital) can be measured. This subject is dealt with in Section III of this book. Chapter 26 covers the concept of value creation in greater depth, while Chapter 27 illustrates how it can be measured.

Section 14.3 FINANCIAL ANALYSIS WITHOUT THE RELEVANT ACCOUNTING DOCUMENTS

When a company's accounting documents are not available in due time (less than three months after year-end), it is a sign that the business is in trouble. In many cases, the role of an analyst will then be to assess the scale of a company's losses to see whether it can be turned around or whether their size will doom it to failure.

In this case, the analysts will attempt to establish what proportion of the company's loans the lenders can hope to recover. We saw in Chapter 5 that cash flow statements establish a vital link between net income and the net decrease in debt.

It may perhaps surprise some readers to see that we have often used cash flow statements in reverse, i.e. to gauge the level of earnings by working back from the net decrease in debt.

It is essential to bear in mind the long period of time that may elapse before accounting information becomes available for companies in difficulty. In addition to the usual time lag, the information systems of struggling companies may be deficient and take even longer to produce accounting statements, which are obsolete by the time they are published because the company's difficulties have worsened in the meantime.

Consequently, the cash flow statement is a particularly useful tool for making rapid and timely assessments about the scale of a company's losses, which is the crux of the matter.

It is very easy to calculate the company's net debt. The components of working capital are easily determined (receivables and payables can be estimated from the balances of customer and supplier accounts, and inventories can be estimated based on a stock count). Capital expenditure, increases in cash and asset disposals can also be established very rapidly, even in a sub-par accounting system. We can thus prepare the cash flow statement in reverse to give an estimate of earnings.

A reverse cash flow statement can be used to provide a very rough estimate of a company's earnings, even before they have been reported.

In certain sectors,[6] cash is probably a better profitability indicator than earnings.

When cash starts declining and the fall is not attributable to either heavy capital expenditure that is not financed by debt capital or a capital increase, to the repayment of borrowings, to an exceptional dividend distribution or to a change in the payment terms from clients or to suppliers, the company is operating at a loss, whether or not this is concealed by overstating inventories, reducing customer payment periods, etc.

If the decrease in cash cannot be accounted for by investing or financing activities, it can only come from deterioration in the company's profitability.

Section 14.4 CASE STUDY: ARCELORMITTAL

Is ArcelorMittal solvent? Yes, given its book equity at the close of 2020 ($34.2bn), which is much higher than goodwill ($4.3bn) and inventories ($12.3bn), which are the two items on the asset side of the balance sheet whose value is the most uncertain. Goodwill reduced since 2011 to $4.3bn compared with $14bn in 2011, because there may be doubts about its market value given the group's very low ROCE over several years. Inventories, because further price falls on the market due to surplus production capacities could undermine their value.

Is ArcelorMittal creating value? No, because with an average ROCE still too low (1%) in 2020, the group is not providing its investors with their required rate of return of roughly 10%. Return on equity negative is obviously below the cost of equity (around 12.5%). The destruction of value is not reflected in the group's market capitalisation ($33.5bn), which is above the amount of its book equity ($32.2bn), as the market anticipates much better financial performance in the future.

SUMMARY

The summary of this chapter can be downloaded from www.vernimmen.com.

By the end of a financial analysis, readers must be able to answer the following two questions that served as the starting point for their investigations:

Is the company solvent? Will it be able to repay all its creditors in full?

Is the company creating any value for its shareholders?

A company is solvent when it is able to honour all its commitments by liquidating all of its assets, i.e. if it ceases its operations and puts all its assets up for sale. Solvency depends on the break-up value of a company's assets, and the size of the debts. Net assets, i.e. the difference between assets and total liabilities, are the traditional measure of a company's solvency.

A company creates value if the return on capital employed (after tax) that it generates exceeds the cost of the capital (i.e. equity and net debt) that served to finance capital employed.

Lastly, we recommend that readers who need to carry out a rapid assessment of an ailing company where the accounts are not yet available build a cash flow statement in reverse. This reverse approach starts with reduction in net debt and works back towards net income, thus gauging the scale of losses that put the company's solvency and very survival in jeopardy.

QUESTIONS

1/What risks do lenders run? How can lenders protect themselves against these risks?

2/What is the ultimate guarantee that the lenders will be repaid?

3/What is solvency?

4/Is an insolvent company necessarily required to declare itself bankrupt?

5/A company goes into debt with a one-day maturity in order to buy fixed-rate bonds. Is it running a liquidity risk? And a solvency risk? In what way does the risk manifest itself? What move in interest rates does this company expect?

6/Is a company with negative net assets illiquid? Insolvent?

7/It has been said that a solid financial structure is a guarantee of freedom and independence for a company. Is this true?

8/Why is it difficult to determine the exact value of net assets in consolidated financial statements?

9/Why is the concept of net book value useful?

10/Do you assess solvency by analysing statutory or consolidated accounts?

11/Do you assess liquidity by analysing statutory or consolidated accounts?

You'll find more questions at www.vernimmen.com.

EXERCISE

1/What is your view of the solvency of the following companies?

Groups	Y	N	S
Intangibles	2,549	44,208	218
Tangibles	151	26,309	28
Working capital	−254	3,561	−484
Shareholders' equity	1,530	51,929	−1,327
Net bank and other borrowings	4,404	22,149	1,076
Sales	1,739	80,307	878
EBITDA	475	16,620	261
Operating profit	415	12,077	143

ANSWERS

Questions

1/*The risk of default on payment. Request guarantees or ensure a high level of solvency.*

2/*The value of shareholders' equity.*

3/*The ability to repay its debts in full, even in the event of bankruptcy.*

4/*Sooner or later it will probably have to do so.*

5/*Yes; yes; inability to obtain further loans, capital losses; decline in interest rates.*

6/*Possibly; yes.*

7/*Yes, except when the share price is undervalued, in which case there is a risk of takeover (see Chapter 45).*

8/*Because of minority interests, which entitle holders to assets that are not precisely identified.*

9/*Because it shows the book value of all assets and liabilities of the company.*

10/*Analysing consolidated accounts as they will include all assets and debts of the group. Special attention should be given to heavily geared affiliates.*

11/*Both in order to avoid the case of the parent company that bears a lot of debt with subsidiaries that do not have the capacity to pay sufficient dividends in the short term. In such cases, the parent company may have to sell some of its assets (on unfavourable terms).*

EXERCISE

Y: *Disastrous. Debt is too heavy compared to EBITDA with a debt/EBIDTA ratio of 9.3. There is value in Y thanks to an operating income of £415m, but the value of operating assets is way below the amount of debts; consequently equity is worthless. This company is on the verge of bankruptcy. This is Yell, the UK phone book company, in 2012 just before its bankruptcy in 2014.*

N: *Excellent situation. Financial leverage is low (1.3 × EBITDA). ROCE is very good (16.3% before tax), the group is creating value. Even after deduction of all intangibles, equity remains positive. This is Nestlé in 2018 (it enjoys an AA rating, one of the best for a corporate).*

S: *Disastrous in appearance because equity capital is negative, but as long as creditors continue to lend in order to prevent the company from going bankrupt… The debt level (4.1 × EBITDA) could be seen as acceptable and S could repay its debts by their due date and build up its equity capital again. But perhaps this would be at the cost of underinvestment, which is threatening the company's future. This is Solocal, a phone-book company, in 2015, a year before a massive debt-for-equity swap.*

NOTES

1 *We disregard the impact of carrybacks here, i.e. tax benefits which make it possible to reduce current tax liability against the losses of past periods, if they exist.*

2 *In year 0, since the company is profitable, financial expense is only 2 given the income tax rate of 35% (rounded figures). In addition, to keep things simple, it is assumed that the entire amount of net income is paid out as a dividend.*

3 *Market value is observed rather than calculated.*

4 *To keep things simple, it is assumed that the entire amount of net income is paid out as a dividend.*

5 *Market value is observed rather than calculated.*

6 *Like construction, defence*.

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Section II
INVESTORS AND MARKETS

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PART ONE
INVESTMENT DECISION RULES

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Chapter 15
THE FINANCIAL MARKETS

Now let's talk finance

This section will analyse the behaviour of the investor who buys financial instruments that the financial manager is trying to sell. Investors are free to buy a security or not and, if they decide to buy it, they are then free to hold it or resell it in the secondary market.

The financial investor seeks two types of returns: the risk-free interest rate (which we call the time value of money) and a reward for risk-taking. This section looks at these two types of returns in detail but, first, here are some general observations about financial markets.

Section 15.1 THE ROLE OF CAPITAL MARKETS

The primary role of a financial system is to bring together economic agents with surplus financial resources, such as households, and those with net financial needs, such as companies and governments. This relationship is illustrated below:

To use the terminology of John Gurley and Edward Shaw (1960), the parties can be brought together **directly** or **indirectly**.

In the first case, known as **direct finance**, the parties with excess financial resources directly finance those with financial needs. The financial system serves as a **broker**, matching the supply of funds with the corresponding demand. This is what happens when an individual shareholder subscribes to a listed company's share issue or when a bank places a corporate bond issue with individual investors.

In the second case, or **indirect finance**, financial intermediaries, such as banks, buy “securities” – i.e. loans – “issued” by companies. The banks in turn collect funds, in the form of demand or savings deposits, or issue their own securities that they place with investors. In this model, the financial system serves as a gatekeeper between suppliers and users of capital and performs the function of **intermediation**.

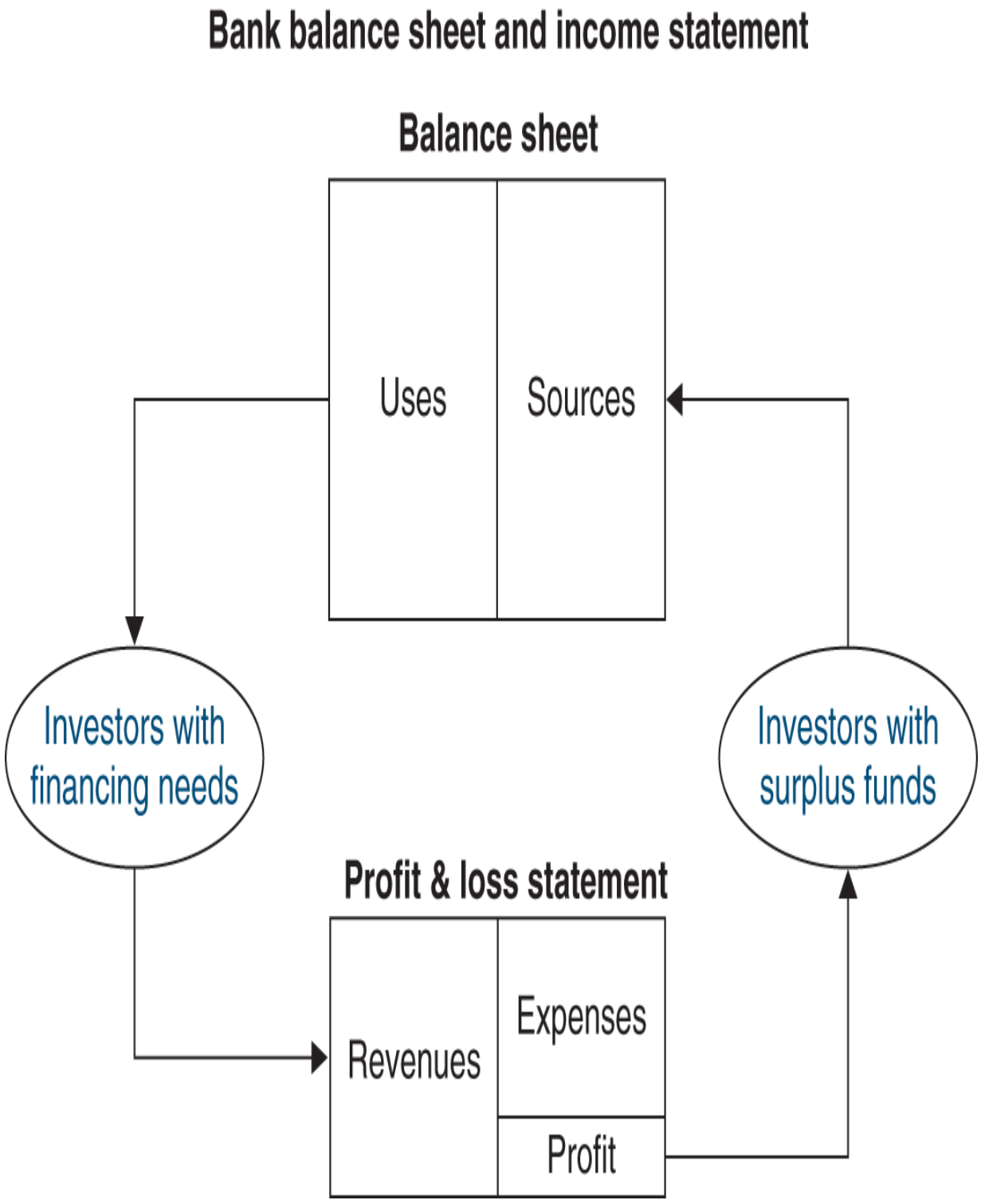
When you deposit money in a bank, the bank uses your money to make loans to companies. Similarly, when you buy bonds issued by a financial institution, you enable the institution to finance the needs of other industrial and commercial enterprises through loans. Lastly, when you buy an insurance policy, you and other investors pay premiums that the insurance company uses to invest in the bond market, the property market, etc.

This activity is called **intermediation**, and is very different from the role of a mere broker in the direct finance model.

With direct finance, the amounts that pass through the broker's hands do not appear on its balance sheet, because all the broker does is to put the investor and issuer in direct contact with each other. Only brokerage fees and commissions appear on a brokerage firm's profit and loss, or **income**, statement.

In intermediation, the situation is very different. The intermediary shows all resources on the liabilities side of its balance sheet, regardless of their nature: from deposits to bonds to shareholders' equity. Capital serves as the creditors' ultimate guarantee. On the assets side, the intermediary shows all uses of funds, regardless of their nature: loans, investments, etc. The intermediary earns a return on the funds it employs and pays interest on the resources. These cash flows appear in its income statement in the form of revenues and expenses. The difference, or spread, between the two constitutes the intermediary's earnings.

The intermediary's balance sheet and income statement thus function as holding tanks for both parties – those who have surplus capital and those who need it:



Today's economy is experiencing increasing **disintermediation**, characterised by the following phenomena:

more companies are obtaining financing directly from capital markets; and

more companies and individuals are investing directly in capital markets.

When capital markets are underdeveloped, an economy functions primarily on debt financing. Conversely, when capital markets are sufficiently well developed, companies are no longer restricted to debt, and they can then choose to increase their equity financing. Taking a page from the economist John Hicks, it is possible to speak of **bank-based economies** and **market-based economies**.

In a **bank-based economy**, the capital market is underdeveloped and only a small portion of corporate financing needs are met through the issuance of securities. Therefore, bank financing predominates. Companies borrow heavily from banks, whose refinancing needs are mainly covered by the central bank.

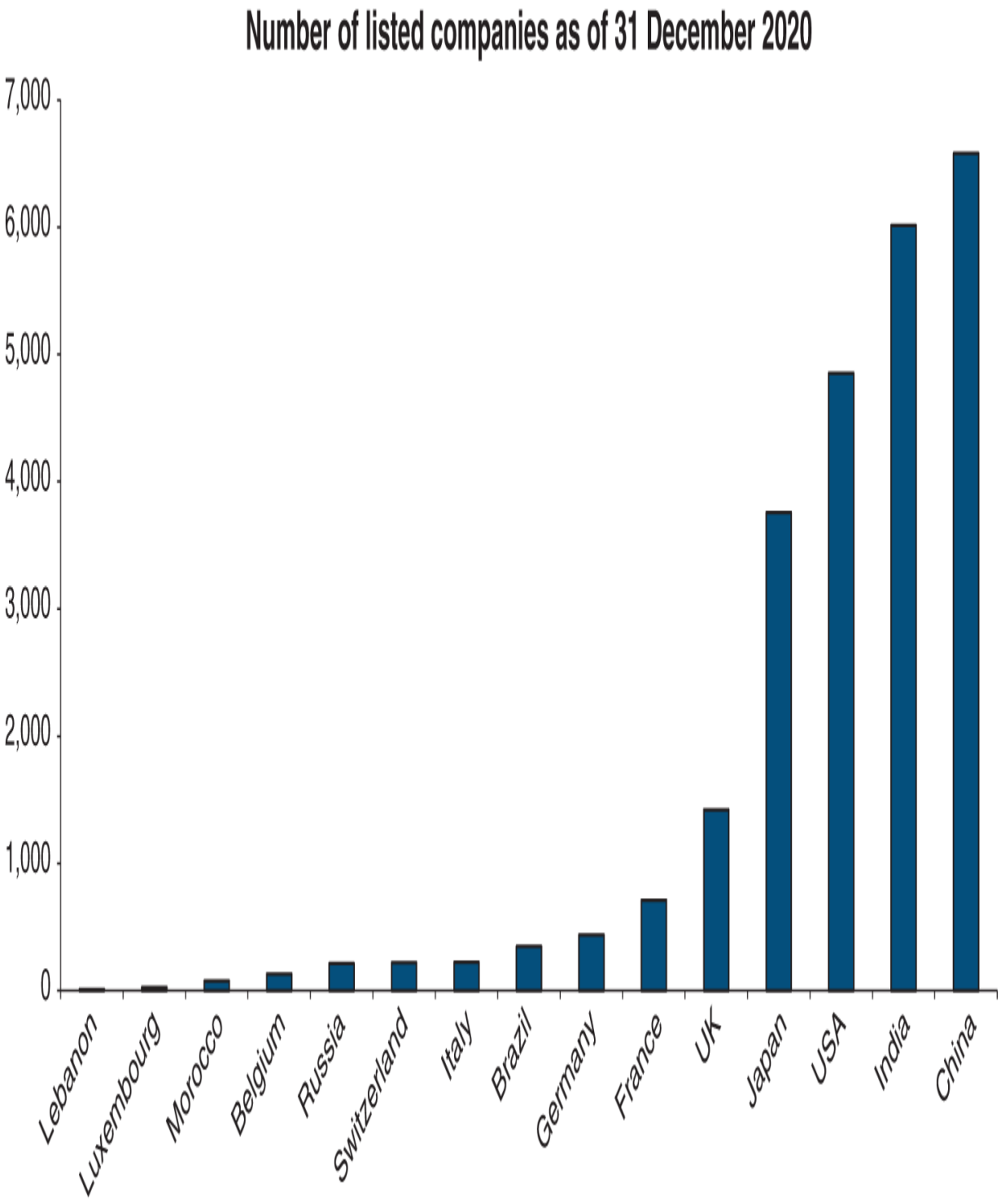
The lender's risk is that the corporate borrower will not generate enough cash flow to service the debt and repay the **principal**, or amount of the loan.

> In an economy with no secondary market, the investor's financial risk lies with the cash flows generated by their assets and their liquidity.

In a **market-based economy**, companies cover most of their financing needs by issuing financial securities (shares, bonds, commercial paper, etc.) directly to investors. A capital market economy is characterised by direct solicitation of investors' funds. Economic agents with surplus resources invest a large portion of their funds directly in the capital markets by buying companies' shares, bonds, commercial paper or other short-term negotiable debt. They do this either directly or through mutual funds. Intermediation gives way to the brokerage function, and the business model of financial institutions evolves towards the placement of companies' securities directly with investors.

In this economic model, bank loans are extended primarily to households in the form of consumer credit, mortgage loans, etc., as well as to small enterprises that do not have access to the capital markets.

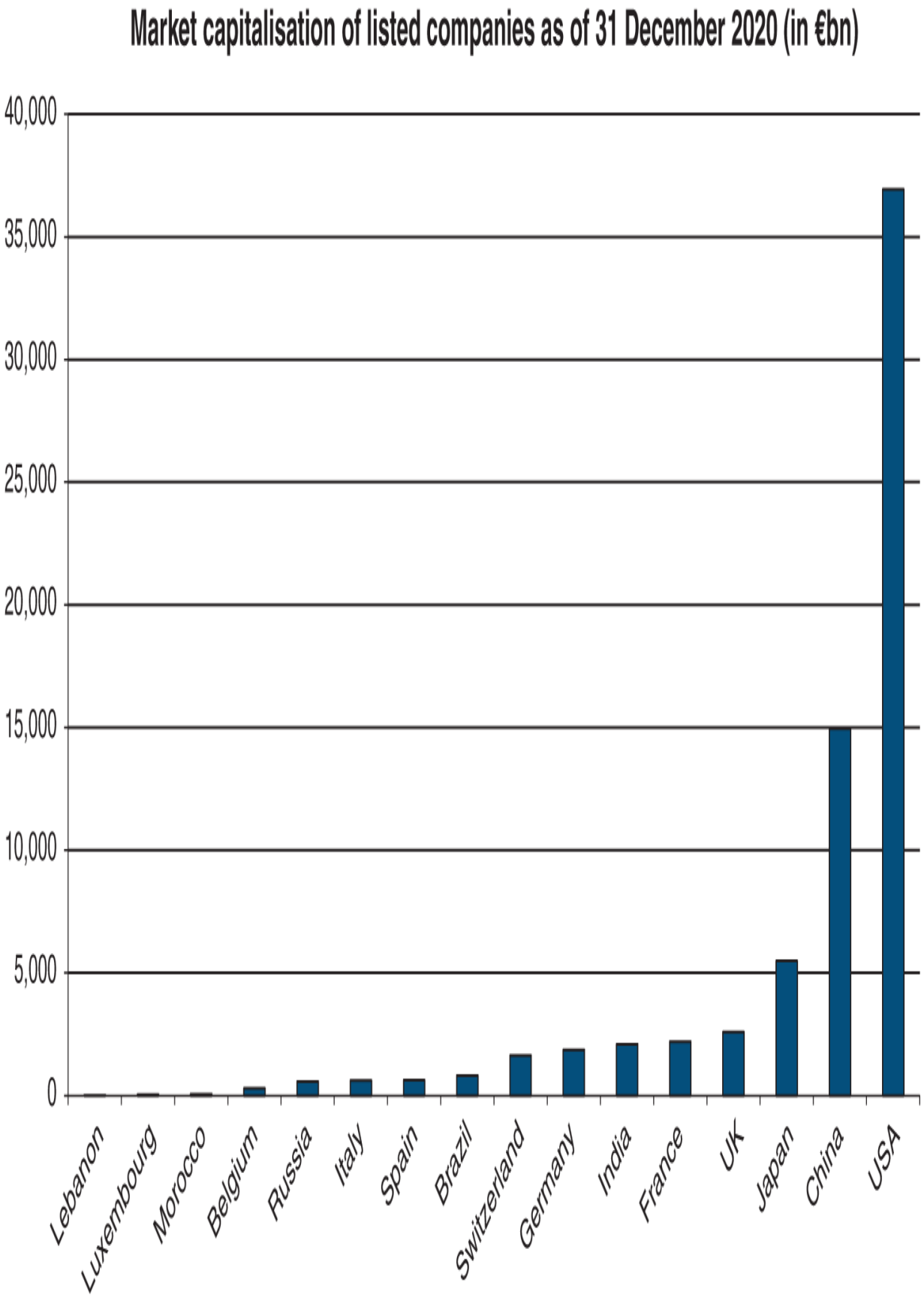
The following graphs provide the best illustration of the rising importance of capital markets.



…be it in terms of the number of listed companies…

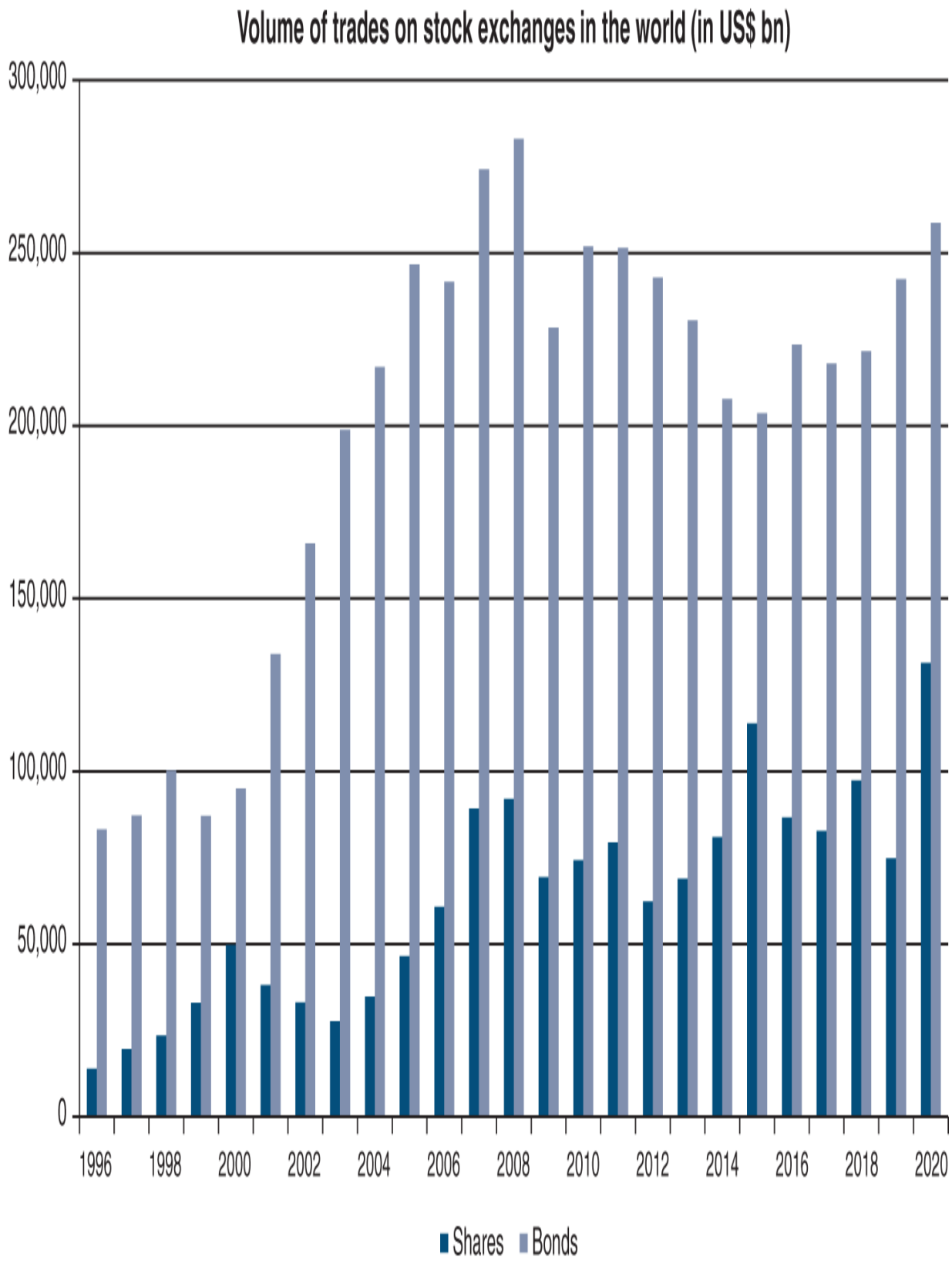
Note: Domestic companies only.

Source: Data from World Federation of Exchanges, NYSE-Euronext, London Stock Exchange, Bourse de Casablanca, Bolsa Madrid, Beirut Stock Exchange, Borsa Italiana


Market capitalisation of listed companies as of 31 December 2020 (in €bn)
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
Lebanon
Luxembourg
Morocco
Belgium
Russia
Italy
Spain
Brazil
Switzerland
Germany
India
France
UK
Japan
China
USA

…or market capitalisation

Source: Data from World Federation of Exchanges, NYSE-Euronext, Beirut Stock exchange, Borsa Italiana, London Stock Exchange


Volume of trades on stock exchanges in the world (in US$ bn)
300,000
250,000
200,000
150,000
100,000
50,000
0
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Shares
Bonds

Transaction volumes are linked to the economic environment, even if the long-term trend shows a clear increase.

Source: Data from World Federation of Exchanges, SIFMA

Section 15.2 PRIMARY, SECONDARY AND DERIVATIVE MARKETS

1/ FROM THE PRIMARY MARKET TO THE SECONDARY MARKET

The new issues market (i.e. creation of securities) is called the primary market. Subsequent transactions involving these securities take place on the **secondary market**. Both markets, like any market, are defined by two basic elements: the product (the security) and the price (its value).

Thus, shares issued or created when a company is founded can later be floated on a stock exchange, just as long-term bonds may be used by speculators for short-term strategies. The life of a financial security is intimately connected with the fact that it can be bought or sold at any moment.

From the point of view of the company, the distinction between the primary and secondary markets is fundamental. **The primary market is the market for "new" financial products**, from equity issues to bond issues and everything in between. It is the market for newly minted financial securities where the company can raise fresh money.

Conversely, the secondary market is the market for "used" financial products. Securities bought and sold on this market have already been created and are now simply changing hands, without any new securities being created and consequently without any new money for the company.

The primary market enables companies, financial institutions, governments and local authorities to obtain financial resources by issuing securities. These securities are then listed and traded on secondary markets. The job of the secondary market is to ensure that securities are properly priced and traded. This is the essence of **liquidity**: facilitating the purchase or sale of a security.

The distinction between primary and secondary markets is conceptual only. The two markets are not separated from each other. A given financial investor can buy either existing shares or new shares issued during a capital increase, for example.

If there is often more emphasis placed on the primary market, it is because the function of the financial markets is, first and foremost, to ensure equilibrium between financing needs and the sources of finance. Secondary markets, where securities can change hands, constitute a kind of financial "innovation".

2/ THE FUNCTION OF THE SECONDARY MARKET

Financial investors do not intend to remain invested in a particular asset indefinitely. Even before they buy a security, they begin thinking about how they will **exit**. As a result, they are constantly evaluating whether they should buy or sell such and such an asset.

Monetising is relatively easy when the security is a short-term one. All the investor has to do is wait until maturity. The need for an exit strategy grows with the maturity of the investment and is greatest for equity investments, whose maturity is unlimited. The only way a shareholder can exit their investment is to sell their shares to someone else.

As an example, the successful business person who floats their company on the stock exchange, thereby selling part of their shares to new shareholders, diversifies their own portfolio, which before flotation was essentially concentrated in one investment.

> The secondary market makes the investor's investments liquid.

Liquidity refers to the ability to convert an instrument into cash quickly and without loss of value. It affords the opportunity to trade a financial instrument at a "listed" price and in large quantities without disrupting the market. An investment is liquid when an investor can buy or sell it in large quantities without causing a change in its market price.

The secondary market is therefore a **zero-sum game** between investors, because what one investor buys, another investor sells. In principle, the secondary market operates completely independently from the issuer of the securities.

A company that issues a bond today knows that a certain amount of funds will remain available in each future year. This knowledge is based on the

bond's amortisation schedule. During that time, however, the investors holding the bonds will have changed.

Secondary market transactions do not show up in macroeconomic statistics on capital formation, earning them the scorn of some observers who claim that the secondary market does nothing to further economic development, but only bails out the initial investors.

We believe this thinking is misguided and reflects great ignorance about the function of secondary markets in the economy. Remember that a financial investor is constantly comparing the primary and secondary markets. They care little whether a “new” or a “used” security is being bought, so long as they have the same characteristics.

> The secondary market plays the fundamental role of valuing securities.

In fact, the quality of a primary market for a security depends greatly on the quality of its secondary market. Think about it: who would want to buy a financial security on the primary market, knowing that it will be difficult to sell it on the secondary market?

The secondary market determines the price at which the company can issue its securities on the primary market, because investors are constantly deciding between existing investments and proposed new investments.

We have seen that it would be a mistake to think that a financial manager takes no interest in the secondary market for the securities issued by the company. On the contrary, it is on the secondary market that the company's financial “raw material” is priced every day. When the raw material is equities, there is another reason the company cannot afford to turn its back on the secondary market: this is where investors trade the voting rights in the company's affairs and, by extension, control of the company.

3/ DERIVATIVE MARKETS: FUTURES AND OPTIONS

Derivative markets are where securities that derive their value from another asset (share, bond, commodity or even climate index) are traded. There are two main types of derivative products: options (which we will develop in

Chapter 23 as they have become a key matter in financial theory and practice) and futures (Chapter 51).

> Derivatives are instruments for taking positions on other instruments, or "contracts on contracts". They let you take significant short or long positions on other assets with a limited outlay of funds.

Derivative instruments are tailored especially to the management of financial risk. By using derivatives, the financial manager chooses a price – expressed as an interest rate, an exchange rate or the price of a raw material – that is independent of the company's financing or investment term. Derivatives are also highly liquid. The financial manager can change their mind at any time at a minimal cost.

Options and futures allow one to take important risks with a reduced initial outlay due to their leverage effect (this is called speculation), or on the contrary to transfer risks to a third party (hedging), and this is what companies normally use them for.

Section 15.3 THE FUNCTIONS OF A FINANCIAL SYSTEM

The job of a financial system is to efficiently create financial liquidity for those investment projects that promise the highest profitability and that maximise collective utility.

However, unlike other types of markets, a financial system does more than just achieve equilibrium between supply and demand. A financial system allows investors to convert current revenues into future consumption. It also provides current resources for borrowers, at the cost of reduced future spending.

Robert Merton and Zvi Bodie have isolated **six essential functions** of a financial system:

A financial system provides means of payment to facilitate transactions. Cheques, debit and credit cards, electronic transfers, bitcoins, etc. are all means of payment that individuals can use to facilitate the acquisition of goods and services. Imagine if everything could only be paid for with bills and coins!

A financial system provides a means of pooling funds for financing large, indivisible projects. A financial system is also a mechanism for subdividing the capital of a company so that investors can diversify their investments. If factory owners had to rely on just their own savings, they would very soon run out of investible funds. Indeed, without a financial system's support, Nestlé and British Telecom would not exist. The system enables the entrepreneur to gain access to the savings of millions of individuals, thereby diversifying and expanding their sources of financing. In return, the entrepreneur is expected to achieve a certain level of performance. Returning to our example of a factory, if you were to invest in your neighbour's steel plant, you might have trouble getting your money back if you should suddenly need it. A financial system enables investors to hold their assets in a much more liquid form: shares, bank accounts, etc.

A financial system distributes financial resources across time and space, as well as between different sectors of the economy. The financial system allows capital to be allocated in a myriad of ways. For example, young people can borrow to buy a house or people approaching retirement can save to offset future decreases in income. Even a developing nation can obtain resources to finance further development. And when an industrialised country generates more savings than it can absorb, it invests those surpluses through financial systems. In this way, “old economies” use their excess resources to finance “new economies”.

A financial system provides tools for managing risk. It is particularly risky (and inefficient as we will see later) for an individual to invest all of their funds in a single company because, if the company goes bankrupt, they lose everything. By creating collective savings vehicles, such as mutual funds, brokers and other intermediaries enable individuals to reduce their risk by diversifying their exposure. Similarly, an insurance company pools the risk of millions of people and insures them against risks they would otherwise be unable to assume individually.

A financial system provides price information at very low cost. This facilitates decentralised decision-making. Asset prices and interest rates constitute information used by individuals in their decisions about how to consume, save or divide their funds among different assets. But research and analysis of the available information on the financial condition of the borrower is time-consuming, costly and typically beyond the scope of the layperson. Yet when a financial institution does this work on behalf of thousands of investors, the cost is greatly reduced.

A financial system provides the means for reducing conflict between the parties to a contract. Contracting parties often have difficulty monitoring each other's behaviour. Sometimes conflicts arise because each party has different amounts of information and divergent contractual ties. For example, an investor gives money to a fund manager in the hope that they will manage the funds in the investor's best interests (and not their own!). If the fund manager does not uphold their end of the bargain, the market will lose confidence in them. Typically, the consequence of such behaviour is that they will be replaced by a more conscientious manager.

Section 15.4 THE RELATIONSHIP BETWEEN BANKS AND COMPANIES

Not so long ago, banks could be classified as:

Commercial banks that schematically collected funds from individuals and lent to corporates.

Investment banks that provided advisory services (mergers and acquisitions, wealth management) and played the role of a broker (placement of shares, of bonds) but without “using their balance sheet”.

Since the beginning of this century, large financial conglomerates have emerged both in the US and Europe. This resulted from mega-mergers between commercial banks and investment banks: BNP/Paribas, Citicorp/Travelers Group, Chase Manhattan/JP Morgan, Bank of America/Merrill Lynch, or the transition by investment banks towards commercial banking (Goldman Sachs, Mediobanca) or the reverse (Credit Suisse, Credit Agricole).

This trend, eased by changes in regulation (in particular in the US with the reform of the Glass–Steagall Act in 1999), shows a willingness of large banking groups to adopt the business model of a universal bank (also called “one-stop shopping”) in a context of increasing internationalisation and complexity. This is particularly true for certain business lines like corporate finance or fund management, in which size constitutes a real competitive advantage.

Following the 2008 financial crisis, there emerged a certain political willingness to split up large banking groups again, specifically in order to separate deposits from market-related activities. This idea (not only guided by the protection of households' deposits) has only partially materialised in laws (in the US, France, the UK) aimed mainly at confining speculative operations and avoiding market activities that put clients' deposits at risk (Volker regulation in particular).

Large banking groups now generally include the following business lines:

Retail banking: for individuals and small and medium-sized corporates. Retail banks serve as intermediaries between those who have surplus funds and those who require financing. The banks collect resources from the former and lend money to the latter. They have millions of clients and therefore adopt an industrial organisation. The larger the bank's portfolio, the lower the risk – thanks once again to the law of large numbers. Retail banking is an extremely competitive activity. After taking into account the cost of risk, profit margins are very thin. Bank loans are somewhat standard products, so it is relatively easy for customers to play one bank off against another to obtain more favourable terms. Retail banks have developed ancillary services to add value to the products that they offer to their corporate customers. Accordingly, they offer a variety of means of payment to help companies move funds efficiently from one place to another. They also help clients to manage their cash flows or their short-term investments (see Chapter 50). A retail banking division also generally includes some specific financial services for individuals (e.g. consumer credit) or for corporates (factoring, leasing, etc.), as such services are used mostly by small and medium-sized firms.

Corporate and investment banking (CIB): provides large corporates with sophisticated services. Such banks have, at most, a few thousand clients and offer primarily the following services:

Access to equity markets (equity capital markets, ECM): investment banks help companies prepare and carry out initial public offerings on the stock market. Later on, investment banks can continue to help these companies by raising additional funds through capital increases. They also advise companies on the issuance of instruments that may one day become shares of stock, such as warrants and convertible bonds (see Chapter 24) or the disposal of blocks of a listed subsidiary.

Access to bond markets (debt capital markets, DCM): similarly, investment banks help large and medium-sized companies raise funds directly from investors through the issuance of bonds. The techniques of placing securities, and in particular the role of the investment bank in this type of transaction, will be discussed in Chapter 25. The investment bank's trading room is where its role as “matchmaker” between the investor and the issuer takes on its full meaning.

Merger and acquisition (M&A) advisory services: these investment banking services are not directly linked to corporate financing or the capital markets, although a public issue of bonds or shares often accompanies an acquisition (see Chapter 45). The first three activities are called **investment banking**.

Bank financing: syndicated loans, bilateral lines, structured financing (see Chapter 21).

Access to foreign exchange, interest rate and commodities markets: for the hedging of risk. The bank also uses these desks for speculating on its own account (see Chapter 51).

Asset management: has its own clients – institutional investors and high-net-worth individuals – but also serves some of the retail banking clients through mutual funds. The asset management arm may sometimes use some of the products tailored by the investment banking division (hedging, order execution). This business is increasingly operated by players that are independent (totally or partially) from large banks.

Besides these global banking groups operating across all banking activities, some players have focused on certain targeted services like mergers and acquisitions and asset management (Lazard and Rothschild, for example), retail (it is the case for internet based new banks like N26, Revolut or Orange Bank) or specific geographical areas (Mediobanca and Lloyds Bank, for example).

The 2020 crisis (after 2008) demonstrated again the central role played by banks in the economy. They are suppliers of liquidity; they are also an indicator of investor risk aversion. The basic duty of a bank is to assess risk and repackage it while eliminating the diversifiable risk.

Section 15.5 THEORETICAL FRAMEWORK: EFFICIENT MARKETS

An efficient market is one in which the prices of financial securities at any time rapidly reflect all available relevant information. The terms “perfect market” or “market in equilibrium” are synonymous with “efficient market”.

In an efficient market, prices instantly reflect the consequences of past events and all expectations about future events. As all known factors are already integrated into current prices, it is therefore impossible to predict future variations in the price of a financial instrument. Only new information will change the value of the security. Future information is, by definition, unpredictable, so changes in the price of a security are random. This is the origin of the **random walk** character of daily returns in the securities markets.

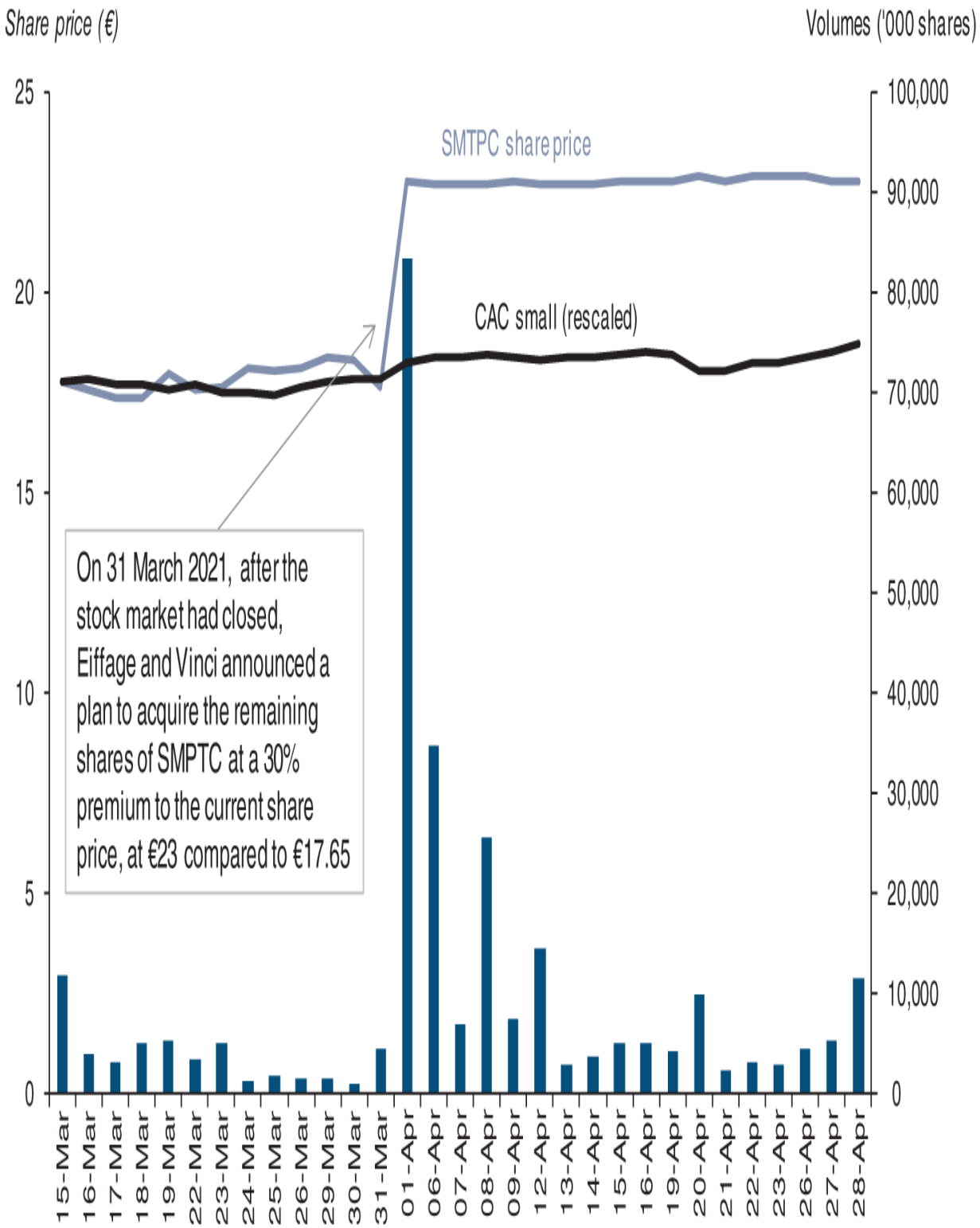
Competition between financial investors is so fierce that prices adjust to new information almost instantaneously. At every moment, a financial instrument trades at a price determined by its return and its risk as perceived by its investors.

Eugene Fama (1970) has developed the following three tests to determine whether a market is efficient: ability to predict future prices, market response to specific events, impact of insider information on the market.

In a **weak-form** efficient market, it is impossible to predict future returns. Existing prices already reflect all the information that can be gleaned from studying **past prices** and **trading volumes**. **The efficient market hypothesis says that technical analysis has no practical value**, nor do martingales (martingales in the ordinary, not the mathematical, sense). For example, the notion that “if a stock rises three consecutive times, buy it; if it declines two consecutive times, sell it” is irrelevant. Similarly, the efficient market hypothesis says that models relating future returns to interest rates, dividend yields, the spread between short- and long-term interest rates or other parameters are equally worthless.

A **semi-strong** efficient market reflects all publicly available information, as found in annual reports, newspaper and magazine articles, prospectuses, announcements of new contracts, of a merger, of an increase in the dividend, etc. This hypothesis can be empirically tested by studying the reaction of market prices to company events (**event studies**). In fact, the price of a stock reacts immediately to any announcement of relevant new information regarding a company. In an efficient market, no impact should be observable prior to the announcement, nor during the days following the announcement. In other words, prices should adjust rapidly only at the time any new information is announced.

An example of market efficiency: the announcement of the SMTPC acquisition project by Eiffage and Vinci, 31 March 2021



Source: Data from Euronext

In order to prevent investors with prior access to information from using it to their advantage (and therefore to the detriment of other investors), stock market regulators suggest that firms communicate before market opening or after market closure, or suspend trading prior to a mid-session announcement of information that is highly likely to have a significant impact on the share price. Trading resumes a few hours later or the following day so as to ensure that all interested parties receive the information. Then, when trading resumes, no investor has been short-changed.

In a **strongly** efficient financial market, investors with privileged or insider information or with a monopoly on certain information are unable to influence securities prices. This holds true only when financial market regulators have the power to prohibit and punish the use of insider information.

In theory, professional investment managers have expert knowledge that is supposed to enable them to post better performances than the market average. However, without using any inside information, the efficient market hypothesis says that market experts have no edge over the layperson. In fact, in an efficient market, the experts' performance is slightly below the market average, in a proportion directly related to the management fees they charge!

Actual markets approach the theory of an efficient market when participants have low-cost access to all information, transaction costs are low, the market is liquid and investors are rational.

Take the example of a stock whose price is expected to rise 10% tomorrow. In an efficient market, its price will rise today to a level consistent with the expected gain. “Tomorrow's” price will be discounted to today. Today's price becomes an estimate of the value of tomorrow's price.

Section 15.6 ANOTHER THEORETICAL FRAMEWORK UNDER CONSTRUCTION: BEHAVIOURAL FINANCE

Since the end of the 1960s, a large number of research papers have focused on testing the efficiency of markets. It is probably the most tested assumption of finance! Since the early 1980s, researchers (notably Thaler and Kahneman) have highlighted a number of "anomalies" that tend to go against the efficiency of markets:

Excess volatility. The first issue with efficient market theory seems very intuitive: how can markets be so volatile? Information on Sanofi is not published every second. Nevertheless, the share price does move at each instant. There seems to be some kind of noise around fundamental value. As described by Benoit Mandelbrot, who first used fractals in economics, prices evolve in a discrete way rather than in a continuous manner.

Dual listing and closed-end funds. Dual listings are shares of twin companies listed on two different markets. Their stream of dividends is, by definition, identical but we can observe that their price can differ over a long period of time. Similarly, the price of a closed-end fund (made up of shares of listed companies) can differ from the sum of the value of its components. Conglomerate discount (see Chapter 42) cannot explain the magnitude of the discount for certain funds and certainly not the premium for some others. It is interesting to see that these discounts can prevail over a long period of time, therefore making any arbitrage (although easy to conceptualise) hard to put in place.

Calendar anomalies. Stocks seem to perform less well on Mondays than on other days of the week and provide higher returns in the month of January compared to other months of the year (in particular for small and medium-sized enterprises). Nevertheless, these calendar anomalies are not material enough to allow for systematic and profitable arbitrage given transaction costs. For each of these observations, some justifications consistent with the rationality of investor behaviour can be put forward.

Meteorological anomalies. There is consistent observation that stock prices perform better when the sun shines than when it rains. There again, although statistically significant, these anomalies are not material enough to generate arbitrage opportunities.

There are some grounds to think a certain number of situations challenge the validity of the efficient market theory. Nevertheless, Eugene Fama, one of the founders of this theory, defends it strongly. He calls into question the methodologies used to find anomalies. **Behavioural finance rejects the founding assumption of market efficiency: what if investors were not rational?** It tries to build on other fields of social science to derive new conclusions. For example, economists will work with neuroscientists and psychologists to understand individual economic choices. This allows us to suppose that some decisions are influenced by circumstances and the environment.

One of the first tests for understanding people's reasoning in making a choice is based on lotteries (gains with certain probabilities). The following attitudes can be observed:

Gains and losses are not treated equally by investors: they will take risks when the probability of losing is high (they prefer a 50% chance of losing 100 to losing 50 for sure) whereas they will prefer a small gain if the probability is high (getting 50 for sure rather than a 50% chance of 100).

If the difference (delta) in probability is narrow, the investor will choose the lottery with the highest return possible, but if the delta in probability is high, the investor will think in terms of weighted average return. This may generate some paradoxes: preferring Natixis to UBS, UBS to Mediobanca but Mediobanca to Natixis! This could drive an asset manager mad!

The lack of rationality of some investors would not be a problem if arbitrage made it possible to correct anomalies and if efficiency could be brought back rapidly. Unfortunately, anomalies can be observed over the long term.

The theory of mimicry is an illustration of behavioural finance. The economist André Orléan has distinguished three types of mimicry:

Normative mimicry – which could also be called “conformism”. Its impact on finance is limited and is beyond the scope of this text.

Informational mimicry – which consists of imitating others because they supposedly know more. It constitutes a rational response to a problem of dissemination of information, provided the proportion of imitators in the group is not too high. Otherwise, even if it is not in line with objective economic data, imitation reinforces the most popular choice, which can then interfere with efficient dissemination of information.

Self-mimicry – which attempts to predict the behaviour of the majority in order to imitate it. The "right" decision then depends on the collective behaviour of all other market participants and can become a self-fulfilling prophecy, i.e. an equilibrium that exists because everyone thinks it will exist. This behaviour departs from traditional economic analysis, which holds that financial value results from real economic value.

The surge in the price of the video game company Gamestop, which went from $18 to $325 in 20 days in January 2021, or that of AMC (movie theatres), which went from $13 to $60 in the first half of 2021, are illustrations of a frenetic mimicry, totally disconnected from the economic situation, real or even possible, of these companies. These surges are rooted in the compulsive buying of tens of thousands of people who have never read a single page of the Vernimmen, or any other finance textbook, but who encourage and intoxicate each other on social networks.

> Mimicry can explain speculative bubbles.

Mimetic phenomena can be accentuated by **program trading**, which involves the computer programs used by some traders that rely on pre-programmed buy or sell decisions. These programs can schedule liquidating a position (i.e. selling an investment) if the loss exceeds a certain level. A practical issue with such programs was illustrated on 21 February 2021 by the flash crash of the bitcoin, which lost 34% before recovering its initial price in just one hour.

If some want to destroy efficient market theory, they will have to propose a viable alternative. As of today, the models proposed by "behaviourists" cannot be used, they merely model the behaviour of investors towards investment decisions and products.

We can anticipate that in the future the theoretical framework of finance will mix the rigorous approach of neoclassical theories (including the efficient market theory) with the more realistic understanding of the decision process of investors that behavioural finance will provide.

Section 15.7 INVESTORS' BEHAVIOUR

At any given point in time, each investor is either:

a hedger;

a speculator; or

an arbitrageur.

1/ HEDGING

When an investor attempts to protect himself from risks they do not wish to assume, they are said to be **hedging**. The term “to hedge” describes a general concept that underlies certain investment decisions, for example, the decision to match a long-term investment with long-term financing, to finance a risky industrial investment with equity rather than debt, etc.

This is simple, natural and healthy behaviour for non-financial managers. Hedging protects a manufacturing company's margin, i.e. the difference between revenue and expenses, from uncertainties in areas relating to technical expertise, human resources, sales and marketing, etc. Hedging allows the economic value of a project or line of business to be managed independently of fluctuations in the capital markets.

Accordingly, a European company that exports products to the US may sell dollars forward against euros, guaranteeing itself a fixed exchange rate for its future dollar-denominated revenues. The company is then said to have hedged its exposure to fluctuations in currency exchange rates.

> An investor hedges when they do not wish to assume a calculated risk.

2/ SPECULATION

In contrast to hedging, which eliminates risk by transferring it to a party willing to assume it, speculation is the assumption of risk. A speculator takes a position when they make a bet on the future value of an asset. If they think its price will rise, they buy it. If it rises, they win the bet; if not, they lose. If they are to receive dollars in a month's time, they may take no

action now because they think the dollar will rise in value between now and then. If they have long-term investments to make, they may finance them with short-term funds because they think that interest rates will decline in the meantime and they will be able to refinance at lower cost later. This behaviour is diametrically opposed to that of the hedger.

Traders are professional speculators. They spend their time buying currencies, bonds, shares or options that they think will appreciate in value and they sell them when they think they are about to decline. Not surprisingly, their motto is "*Buy low, sell high, play golf!*"

But the investor is also a speculator most of the time. When an investor predicts cash flows, they are speculating about the future. This is a very important point, and you must be careful not to interpret "speculation" negatively. Every investor speculates when they invest, but their speculation is not necessarily reckless. It is founded on a conviction, a set of skills and an analysis of the risks involved. The only difference is that some investors speculate more heavily than others by assuming more risk.

People often criticise the financial markets for allowing speculation. Yet speculators play a fundamental role in the market, an economically healthy role, by assuming the risks that other participants do not want to accept. In this way, speculators minimise the risk borne by others.

Accordingly, a European manufacturing company with outstanding dollar-denominated debt that wants to protect itself against exchange rate risk (i.e. a rise in the value of the dollar vs. the euro) can transfer this risk by buying dollars forward from a speculator willing to take that risk. By buying dollars forward today, the company knows the exact dollar/euro exchange rate at which it will repay its loan. It has thus eliminated its exchange rate risk. Conversely, the speculator runs the risk of a fluctuation in the value of the dollar between the time they sell the dollars forward to the company and the time they deliver them, i.e. when the company's loan comes due.

Likewise, if a market's long-term financing needs are not satisfied, but there is a surplus of short-term savings, then sooner or later a speculator will (fortunately) come along and assume the risk of borrowing short term in order to lend long term. In so doing, the speculator assumes intermediation risk.

Speculative bubbles are unfortunate isolated events, specific human nature and to the normal operation of financial markets, that should not call into question their utility.

What, then, do people mean by a “speculative market”? A speculative market is a market in which all the participants are speculators. Market forces, divorced from economic reality, become self-sustaining because everyone is under the influence of the same phenomenon. Once a sufficient number of speculators think that a stock will rise, their purchases alone are enough to make the stock price rise. Their example prompts other speculators to follow suit, the price rises further, and so on. But at the first hint of a downward revision in expectations, the mechanism goes into reverse and the share price falls dramatically. When this happens, many speculators will try to liquidate positions in order to pay off loans contracted to buy shares in the first place, thereby further accentuating the downfall.

3/ ARBITRAGE

In contrast to the speculator, the arbitrageur is not in the business of assuming risk or having a view on future price of an asset. Instead, they try to earn a profit by exploiting tiny discrepancies which may appear on different markets that are not in equilibrium.

An arbitrageur will notice that Solvay shares are trading slightly lower in London than in Brussels. They will buy Solvay shares in London and sell them simultaneously (or nearly so) at a higher price in Brussels. By buying in London, the arbitrageur bids the price up in London; by selling in Brussels, they drive the price down there. They, or other arbitrageurs, then repeat the process until the prices in the two markets are perfectly in line, or in equilibrium.

With no overall outlay of funds or assumption of risk, arbitrage consists of combining several transactions that ultimately yield a profit.

In principle, the arbitrageur assumes no risk, even though each separate transaction involves a certain degree of risk.

Arbitrage is of paramount importance in a market. By **destroying opportunities as it uncovers them**, arbitrage participates in the development of new markets by creating liquidity. It also eliminates the temporary imperfections that can appear from time to time. As soon as disequilibrium appears, arbitrageurs buy and sell assets and increase market liquidity. It is through their very actions that the disequilibrium is reduced to zero. Once equilibrium is reached, arbitrageurs stop trading and wait for the next opportunity.

> Thanks to arbitrage, all prices on all markets for a given asset are equal at a given point in time. Arbitrage ensures fluidity between markets and contributes to their liquidity. It is the basic behaviour that guarantees market efficiency.

Arbitrage transactions are all the faster to intervene (by computer programs nowadays) when the securities markets are liquid. Otherwise, imbalances may persist for some time on very illiquid securities. Market liquidity and progress in technology make arbitrage opportunities more and more complex and rare. Therefore, some arbitrators are forced in practice to take a certain amount of risk and therefore a speculative component normally foreign to arbitration in the pure sense of the term. In particular, the example given of Solvay is interesting to understand the concept of arbitrage but has not been relevant for quite some time.

Throughout this book, you will see that financial miracles are impossible because arbitrage levels the playing field between assets exhibiting the same level of risk.

You should also be aware that the three types of behaviour described here do not correspond to three mutually exclusive categories of investors. A market participant who is primarily a speculator might carry out arbitrage activities or partially hedge their position. A hedger might decide to hedge only part of their position and speculate on the remaining portion, etc.

The reader will not be fooled by the colloquial use of some words. “Hedge funds” do not operate hedging transactions but are most often involved in speculating. Otherwise, what explanation is there for the fact that they can earn or lose millions of dollars in a few days?

Moreover, these three types of behaviour exist simultaneously in every market. A market cannot function only with hedgers, because there will be no one to assume the risks they don't want to take.[1] As we saw above, a market composed wholly of speculators is not viable either. Finally, a market consisting only of arbitrageurs would be even more difficult to imagine.

> A market is fluid, liquid and displays the “right prices” when its participants include hedgers, speculators and arbitrageurs.

SUMMARY

The summary of this chapter can be downloaded from www.vernimmen.com.

The job of a financial system is to bring together those economic agents with surplus funds and those with funding needs:

either through the indirect finance model, wherein banks and other financial institutions perform the function of intermediation; or

through the direct finance model, wherein the role of financial institutions is limited to that of a broker.

But a financial system also provides a variety of payment means, and it facilitates transactions because the funds of many investors are pooled to finance large projects; and the equity capital of companies is subdivided into small units, enabling investors to diversify their portfolios.

A financial system also distributes financial resources across time and space, and between different sectors. It provides tools for managing risk, disseminates information at low cost, facilitates decentralised decision-making and offers mechanisms for reducing conflict between the parties to a contract.

The term primary market refers to the actual issuance of securities for the first time by issuers who thus find financing. The secondary market refers to the exchanges between investors, who in doing so find liquidity in their investment, and provide a value to these financial securities that then serves as a reference for the primary market. Derivatives markets refer to options and futures markets that allow companies to better hedge their risks.

Financial markets are becoming more important every day, a phenomenon that goes hand-in-hand with their globalisation. The modern economy is no longer a credit-based economy, where bank loans are the predominant form of finance. Today it is rather a capital market economy, wherein companies solicit funding directly from investors via the issuance of shares and bonds.

Alongside their traditional lending function, banks have adapted to the new system by developing advisory services to facilitate corporate

access to the financial markets, be they equity markets or bond markets.

Conceptually, markets are efficient when security prices always reflect all relevant available information. It has been demonstrated that the more liquid a market is, the more readily available information is, the lower transaction costs are and the more individuals act rationally, the more efficient the market is. The last of these factors probably constitutes the biggest hindrance to market efficiency because human beings cannot be reduced to a series of equations. Irrational human behaviour gives rise to mimicry and other anomalies, leading to speculative excesses that specialists in behavioural finance are still trying to comprehend and explain.

A financial market brings together three types of behaviours:

hedgers, who refuse to assume risk and instead wish to protect themselves from it;

speculators, who assume varying degrees of risk; and

arbitrageurs, who exploit market disequilibria and, in so doing, eliminate these discrepancies and therefore ensure market liquidity and efficiency.

The existence of these three types of behaviours is necessary in a market to ensure that the corporates will be in a position to find the financing and hedging products that they need at normal prices.

QUESTIONS

1/Jérôme Kerviel was trying to use the discrepancy between the value of funds and their underlying components in duplicating the funds. This led to a €4.9bn loss. Was this speculation, hedging or arbitrage?

2/What is the economic function of speculation?

3/Can you explain why a narrow-minded financial manager and a narrow-minded businessperson will be unable to understand each other?

4/How can the ordinary saver reduce the risk they face?

5/What feature of a financial instrument makes the interpenetration between the “new market” (primary issues) and the “aftermarket” (secondary market) possible?

6/What conditions are necessary for arbitrage to work?

7/What is the economic function of arbitrage?

8/Can a market in which speculators are the only traders last indefinitely?

9/Would you be speculating if you bought so-called risk-free government bonds? What type of risk is not present in “risk-free” bonds?

10/Investors holding shares in Deliveroo, which lost 36% of its value 3 months after its IPO in March 2021, were told that until they sold, they hadn't lost anything. What do you think?

11/What is a speculative market?

12/What sort of regulatory mechanisms are in place to prevent speculative bubbles on:

derivatives markets;

secondary markets for debt securities;

equity markets?

13/In your view, are more securities issued on the primary market or exchanged on the secondary market?

14/Yes or no?

	Yes	No
Provided that investors' demands are met, companies have access to unlimited funds.		
The announcement of anticipated losses has an impact on the share price.		
Manipulating accounting indicators has no impact on value.		

15/Which of the following statements in your view describe the inefficiency of a market? Which test demonstrates this?

Tax-free US municipal bonds with a lower rate of return for the investor than government bonds which are taxed.

Managers make higher-than-average profits by buying and selling shares in the company they work for.

There is some correlation between the market rate of return during a given quarter and a company's expected change in profits the following quarter.

Market watchers have observed that shares that have shot up in the recent past will go up again in the future.

The market value of a company will tend to go up before the announcement of a takeover bid.

Earnings on shares in a company whose profits have recently risen sharply will be high in the coming months.

On average, earnings on shares that carry a risk are higher than earnings on shares that are relatively risk-free.

16/What is the purpose of behavioural finance?

17/If financial markets are only occasionally efficient, is this of greater concern to small or large companies? Why?

18/Explain how the poor performance of the secondary market can impact the primary market.

You'll find more questions at www.vernimmen.com.

ANSWERS

Questions

1/*In theory, as far as his superiors were concerned, he was executing arbitrage transactions. In reality, he was speculating without his superiors being aware of his actions.*

2/*To take risks which intermediaries do not wish to take.*

3/*The financial manager diversifies their risk. The businessperson often cannot afford to do so.*

4/*They can diversify their portfolio by buying shares in mutual funds or unit trusts.*

5/*Trading costs must be low, all players must have access to all markets and there must be freedom of investment.*

6/*They are fungible assets: a new share is identical to an old share (provides the same rights and obligations).*

7/*To ensure market equilibrium and liquidity.*

8/*No, because it is removed from economic reality.*

9/*Yes, on changes in interest rates. The risk of the issuer going bankrupt. But certain countries have shown that this is well and truly theoretical: Sudan, Venezuela, Argentina…*

10/*No, because assets have a market value at any point in time, and if the share price drops, so too has the net worth of the investor; hoping that it may recover changes nothing!*

11/*A market controlled solely by speculators (it is removed from economic reality).*

12/*Delivery of the underlying security on maturity, which forces equality of the trade price and the price of the underlying security. Repayment, which means that on maturity, the value of the debt security will be equal to the repayment amount. Economic value of the company.*

13/*Far fewer securities are issued on the primary market than exchanged on the secondary market. In 2020, worldwide, listed companies issued $842bn worth of new shares, whereas the value of shares exchanged was $131,370bn (source: World Federation of Exchanges).*

14/*Yes, in theory, as investors are keen to invest in companies able to satisfy their requests for return. No, since it has been anticipated, the share had plenty of time to adjust itself before the official confirmation of the loss. Yes, as accounting window dressing does not, per se, affect cash flows, which are the foundations of value.*

15/*(b), (c), (d), (e), (f): Inefficiency.*

16/*It factors in the non-rational side of investors' behaviour.*

17/*Small companies, since the limited number of investors interested in their shares means that their liquidity is low and that their share prices could shift away from a stable value for long periods.*

18/*If the value of shares continues to decline long term, market pessimism descends, and investors become reluctant to subscribe shares on the primary market, as they are convinced that the value of such shares will fall once issued.*

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NOTES

1 *It would be a miracle if the positions of hedgers were to correspond exactly!*

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Chapter 16
THE TIME VALUE OF MONEY AND NET PRESENT VALUE

A bird in the hand is worth two in the bush

For economic progress to be possible, in normal economic conditions, there must be a time value of money, even in a risk-free environment. This fundamental concept gives rise to the techniques of capitalisation, discounting and net present value, described below.

These are more than just tools, but actual reflexes that must be studied and acquired.

Section 16.1 CAPITALISATION

Consider an example of a businessman who invests €100,000 in his business at the end of 2011 and then sells it 10 years later for €1,800,000. In the meantime, he receives no income from his business, nor does he invest any additional funds into it. Here is a simple problem: given an initial outlay of €100,000 that becomes €1,800,000 in 10 years, and without any outside funds being invested in the business, what is the return on the businessman's investment?

His profit after 10 years was €1,700,000 (€1,800,000 – €100,000) on an initial outlay of €100,000. Hence, his return was (1,700,000 / 100,000) or 1,700% over a period of 10 years.

Is this a good result or not?

Actually, the return is not quite as impressive as it first looks. To find the annual return, our first thought might be to divide the total return (1,700%) by the number of years (10) and say that the average return is 170% per year.

While this may look like a reasonable approach, it is in fact far from accurate. The value 170% has nothing to do with an annual return, which compares the funds invested and the funds recovered after one year. In the case above, there is no income for 10 years. Usually, calculating interest assumes a flow of revenue each year, which can then be reinvested, and which in turn begins producing additional interest.

> To calculate returns over a period greater than one year, we cannot simply compare the end return to the initial outlay and divide by the number of years. This is incorrect reasoning.

There is only one sensible way to calculate the return on the above investment. First, it is necessary to seek the rate of return on a hypothetical investment that would generate income at the end of each year. After 10 years, the rate of return on the initial investment will have to have transformed €100,000 into €1,800,000. Further, the income generated must not be paid out, but rather it has to be reinvested (in which case the income is said to be **capitalised**).

Capitalising income means foregoing receipt of it. It then becomes capital and itself begins to produce interest during the following periods.

Therefore, we are now trying to calculate the annual return on an investment that grows from €100,000 into €1,800,000 after 10 years, with all annual income to be reinvested each year.

An initial attempt to solve this problem can be made using a rate of return equal to 10%. If, at the end of 2011, €100,000 is invested at that rate, it will produce 10% × €100,000, or €10,000 in interest in 2012.

This €10,000 will then be added to the initial capital outlay and begin, in turn, to produce interest. (Hence the term “to capitalise”, which means to add to capital.) The capital thus becomes €110,000 and produces 10% × €110,000 in interest in 2013, i.e. €10,000 on the initial outlay plus €1,000 on the interest from the €10,000 interest earned in 2012 (10% × €10,000). As the interest is reinvested, the capital becomes €110,000 + €11,000, or €121,000, which will produce €12,100 in interest in 2014, and so on.

If we keep doing this until 2020, we obtain a final sum of €259,374, as shown in the table.

Year	Capital at the beginning of the period (€) (1)	Income (€) (2) = 10% × (1)	Capital at the end of the period (€) = (1) + (2)
2012	100,000	10,000	110,000
2013	110,000	11,000	121,000
2014	121,000	12,100	133,100
2015	133,100	13,310	146,410
2016	146,410	14,641	161,051
2017	161,051	16,105	177,156
2018	177,156	17,716	194,872
2019	194,872	19,487	214,359
2020	214,359	21,436	235,795

Year	Capital at the beginning of the period (€) (1)	Income (€) (2) = 10% × (1)	Capital at the end of the period (€) = (1) + (2)
2021	235,795	23,579	259,374

Each year, interest is capitalised and itself produces interest. This is called **compound interest**. This is easy to express in a formula:

$$V_{2012} = V_{2011} + 10\% \times V_{2011} = V_{2011} \times (1 + 10\%)$$

which can be generalised into the following:

$$V_n = V_{n-1} \times (1 + r)$$

where V is a sum and r the rate of return.

Hence, $V_{2012} = V_{2011} \times (1 + 10\%)$, but the same principle can also yield:

$$V_{2013} = V_{2012} \times (1 + 10\%)$$

$$V_{2014} = V_{2011} \times (1 + 10\%)$$

$$V_{2015} = V_{2014} \times (1 + 10\%)$$

All these equations can be consolidated into the following:

$$V_{2021} = V_{2011} \times (1 + 10\%)^{10}$$

Or, more generally:

Capitalisation formula

$$V_n = V_0 \times (1 + r)^n$$

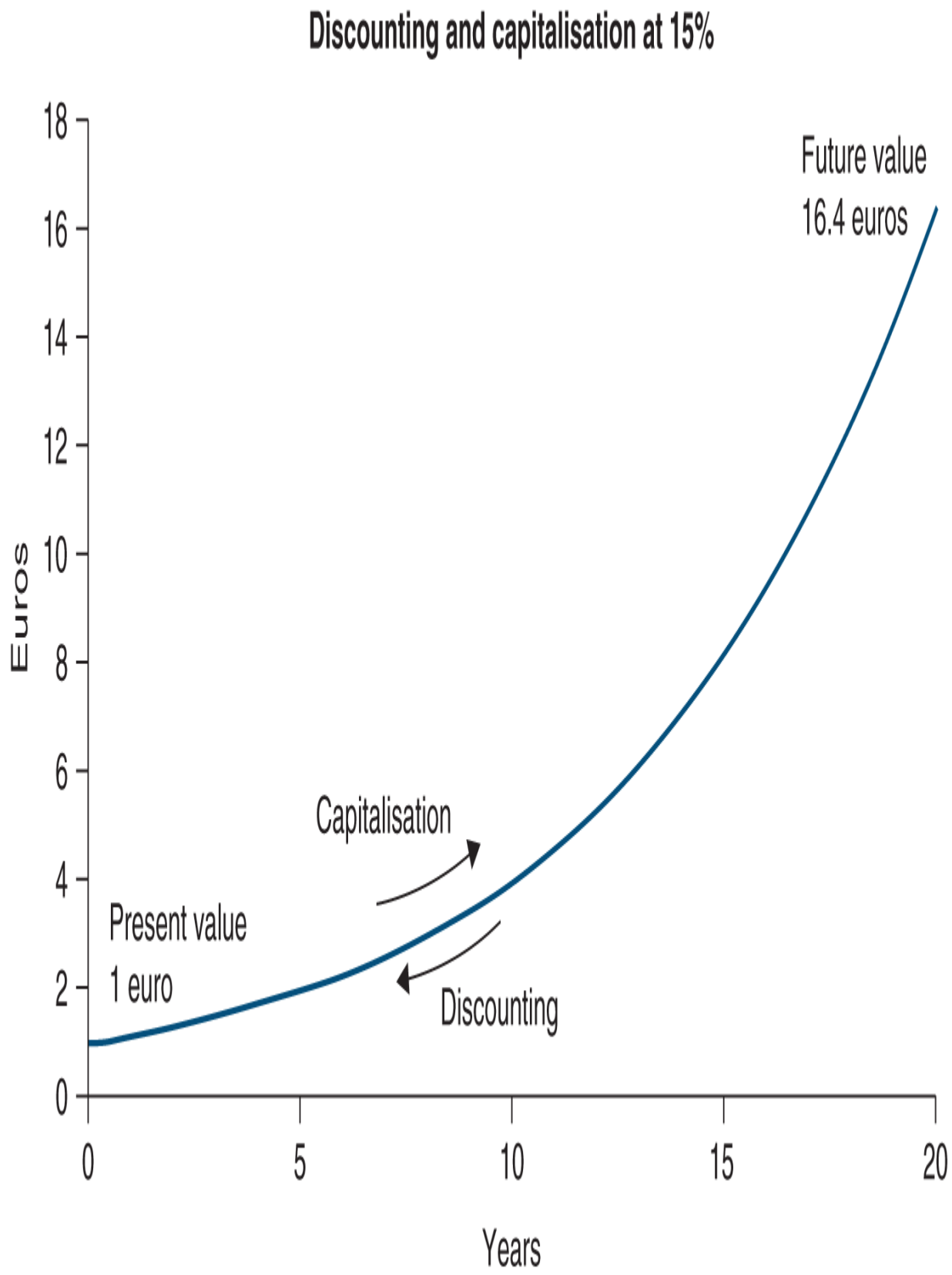
where V_0 is the initial value of the investment, r is the rate of return and n is the duration of the investment in years.

This is a simple equation that gets us from the initial capital to the terminal capital. Terminal capital is a function of the rate *r* and the duration *n*.

Now it is possible to determine the annual return. In the example, the annual rate of return is not 170%, but 33.5% (which is not bad, all the same!). Therefore, 33.5% is the rate on an investment that transforms €100,000 into €1,800,000 in 10 years, with annual income assumed to be reinvested every year at the same rate.

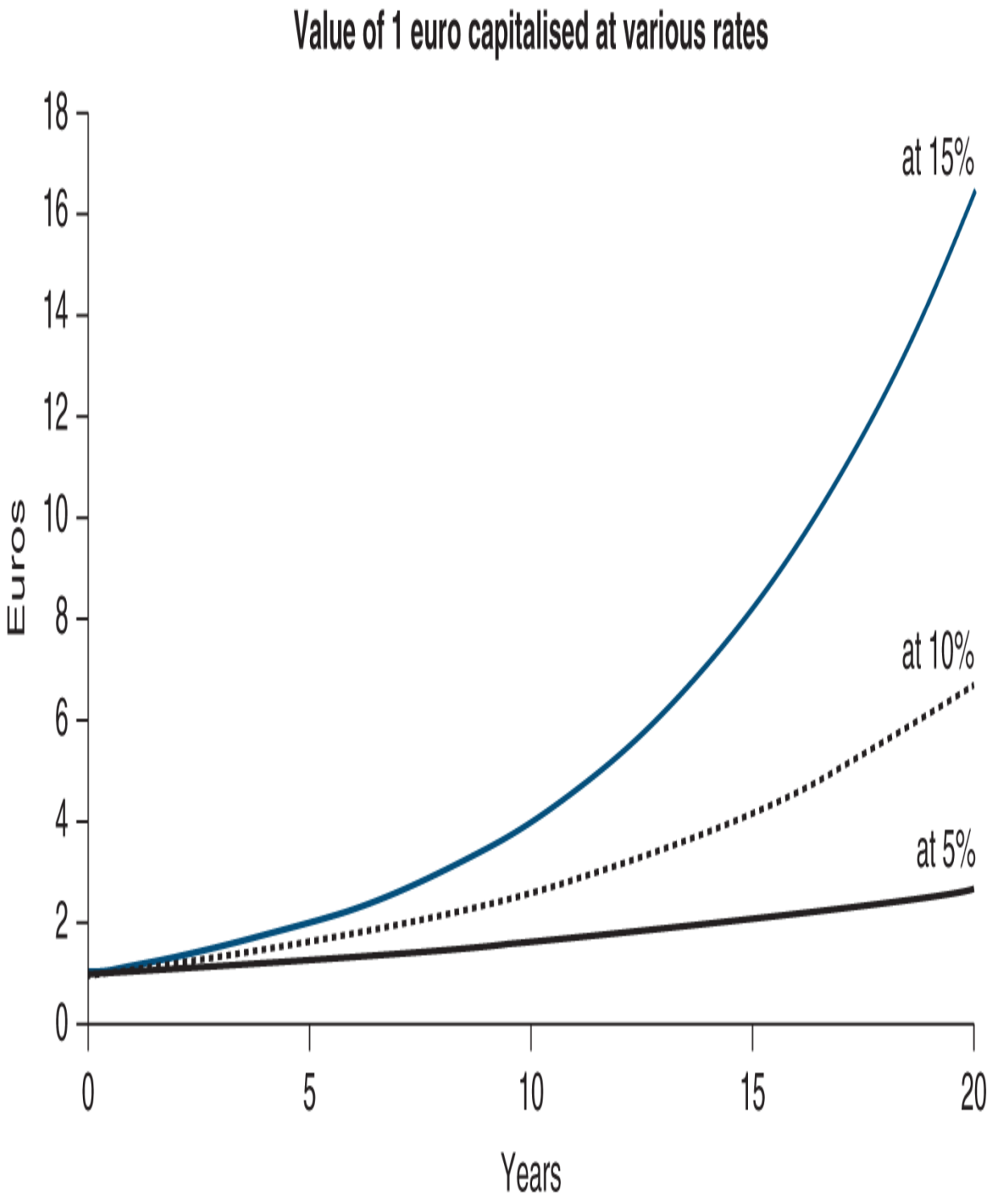
$$33.5\% = \left(\frac{1{,}800{,}000}{100{,}000}\right)^{\frac{1}{10}} - 1$$

To calculate the return on an investment that does not distribute income, it is possible to reason by analogy. This is done using an investment that, over the same duration, transforms the same initial capital into the same terminal capital and produces annual income reinvested at the same rate of return. At 33.5%, annual income of €33,500 for 10 years (plus the initial investment of €100,000 paid back after the tenth year) is exactly the same as not receiving any income for 10 years and then receiving €1,800,000 in the tenth year.


Discounting and capitalisation at 15%
Euros
18
16
14
12
10
8
6
4
2
0
0
5
10
15
20
Years
Future value
16.4 euros
Capitalisation
Present value
1 euro
Discounting

When no income is paid out, the terminal value rises considerably, quadrupling, for example, over 10 years at 15%, but rising 16.4-fold over 20 years at the same rate, as illustrated in this graph.

Over a long period of time, the impact of a change in the capitalisation rate on the terminal value looks as follows:



After 20 years, a sum capitalised at 15% is six times higher than a sum capitalised at one-third the rate (i.e. 5%).

This increase in terminal value is especially important in equity valuations. The example we gave earlier of the businessman selling his company after

10 years is typical. The lower the income he has received on his investment, the more he would expect to receive when selling it. Only a high valuation would give him a return that makes economic sense.

The lack of intermediate income must be offset by a high terminal valuation. The same line of reasoning applies to an industrial investment that does not produce any income during the first few years. The longer it takes it to produce its first income, the greater that income must be in order to produce a satisfactory return.

Tripling one's capital in 16 years, doubling it in 10 years or simply asking for a 7.177% annual return all amount to the same thing, since the rate of return is the same.

No distinction has been made in this chapter between income, reimbursement and actual cash flow. Regardless of whether income is paid out or reinvested, it has been shown that the slightest change in the timing of income modifies the rate of return.

To simplify, consider an investment of 100, which must be paid off at the end of year 1, with an interest accrued of 10. Suppose, however, that the borrower is negligent and the lender absent-minded, and the borrower repays the principal and the interest one year later than they should. The return on a well-managed investment that is equivalent to the so-called 10% on our absent-minded investor's loan can be expressed as:

$$V = V_0 \times (1 + r)^2$$

$$\text{or } 110 = 100 \times (1 + r)^2$$

$$\text{hence } r = 4.88\%$$

This return is less than half of the initially expected return!

It is not accounting and legal appearances that matter, but rather actual cash flows.

> Any precise financial calculation must account for cash flow exactly at the moment when it is received or paid and not just when it is due.

Section 16.2 DISCOUNTING

1/ WHAT DOES IT MEAN TO DISCOUNT A SUM?

> To discount means to calculate the present value of a future cash flow.

Discounting into today's euros helps us compare a sum that will not be produced until later. Technically speaking, what is discounting?

To discount is to “depreciate” the future. It is to be more rigorous with future cash flows than present cash flows, because future cash flows cannot be spent or invested immediately. First, take tomorrow's cash flow and then apply to it a multiplier coefficient below 1, which is called a discounting factor. The discounting factor is used to express a future value as a present value, thus reflecting the depreciation brought on by time.

Consider an offer whereby someone will give you €1,000 in five years. As you will not receive this sum for another five years, you can apply a discounting factor to it, for example, 0.6. The present, or today's, value of this future sum is then 600. Having discounted the future value to a present value, we can then compare it to other values. For example, it is preferable to receive 650 today rather than 1,000 in five years, as the present value of 1,000 five years out is 600, and that is below 650.

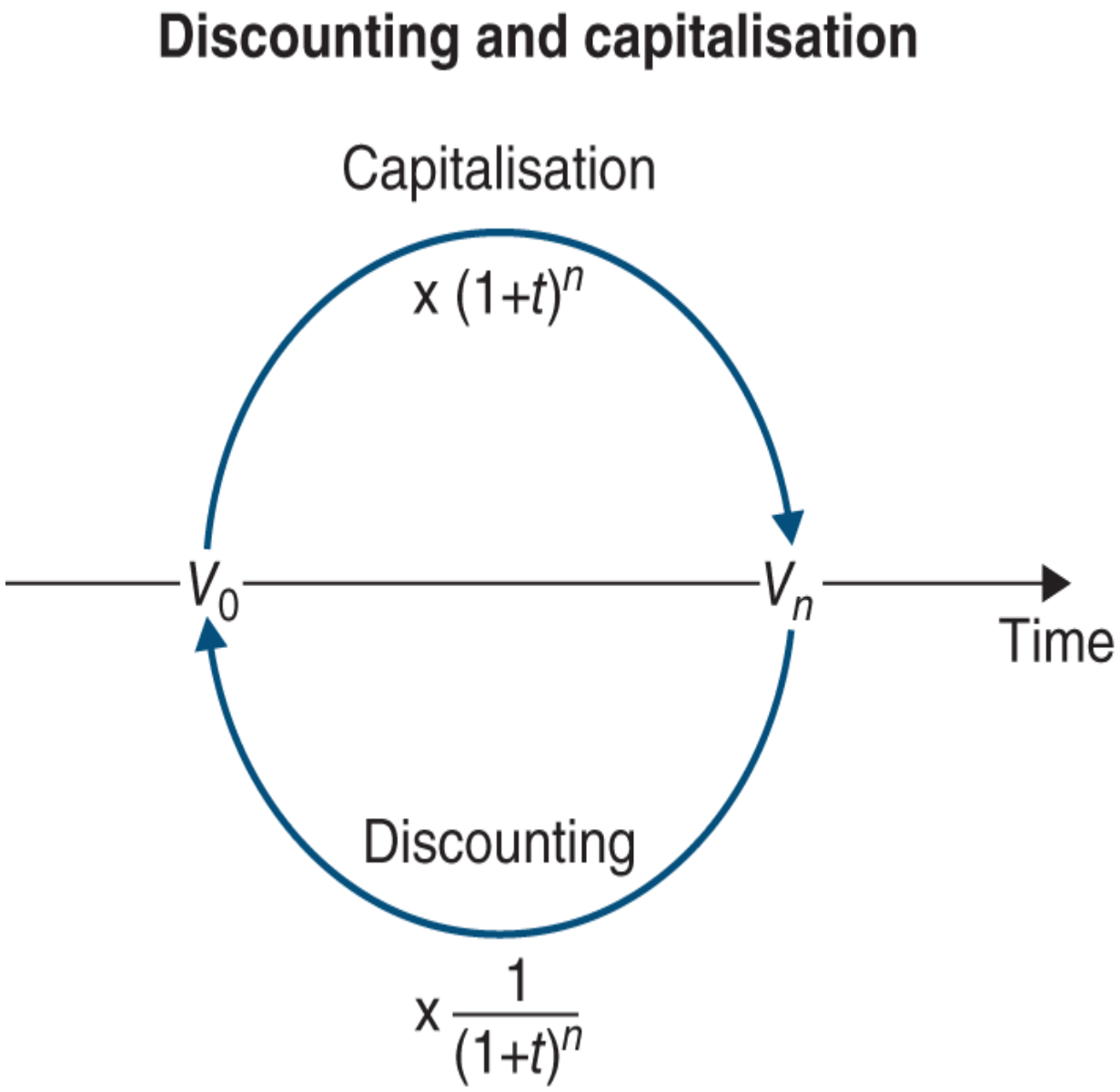
> Discounting makes it possible to compare sums received or paid out at different dates.

Remember that investors discount because**they demand a certain rate of return**. If a security pays you 110 in one year and you wish to see a return of 10% on your investment, the most you would pay today for the security (i.e. its present value) is 100. At this price (100) and for the amount you know you will receive in one year (110), you will get a return of 10% on your investment of 100. However, if a return of 11% is required on the investment, then the price you are willing to pay changes. In this case, you would be willing to pay no more than 99.1 for the security because the gain would have been 10.9 (or 11% of 99.1), which will still give you a final payment of 110.

Discounting is calculated with the required return of the investor. If the investment does not meet or exceed the investor's expectations, they will forego it and seek a better opportunity elsewhere.

Discounting converts a future value into a present value. This is the opposite result of capitalisation.

Discounting converts future values into present values, while capitalisation converts present values into future ones. Hence, to return to the example above, €1,800,000 in 10 years discounted at 33.5% is today worth €100,000. €100,000 today will be worth €1,800,000 when capitalised at 33.5% over 10 years.



Discounting and capitalisation are thus two ways of expressing the same phenomenon: the time value of money.

2/ DISCOUNTING AND CAPITALISATION FACTORS

To discount a sum, the same mathematical formulas are used as those for capitalising a sum. Discounting calculates the sum in the opposite direction to capitalising.

To get from €100,000 today to €1,800,000 in 10 years, we multiply 100,000 by $(1 + 0.335)^{10}$, or 18. The number 18 is the **capitalisation factor**.

To get from €1,800,000 in 10 years to its present value today, we would have to multiply €1,800,000 by $1 / (1 + 0.335)^{10}$, or 0.056. 0.056 is the **discounting factor**, which is the inverse of the coefficient of capitalisation. The present value of €1,800,000 in 10 years at a 33.5% rate is €100,000.

More generally:

Discounting formula $$V_0 = \frac{V_n}{(1+r)^n}$$

which is the exact opposite of the capitalisation formula.

$1 / (1 + r)^n$ is the **discounting factor**, which depreciates V_n and converts it into a present value V_0. It is most often below 1, as discounting rates are generally positive.

Section 16.3 PRESENT VALUE AND NET PRESENT VALUE OF A FINANCIAL SECURITY

Owning a financial security such as a stock or a bond means owning the right to receive cash flows (dividend, interest, reimbursement, etc.) according to the specific terms of the security.

1/ FROM THE PRESENT VALUE OF A SECURITY …

The present value (PV) of a security is the sum of its discounted cash flows, i.e.:

$$PV = \sum_{n=1}^{N} \frac{F_n}{(1+r)^n}$$

where F_n are the cash flows generated by the security, r is the applied discounting rate and n is the number of years for which the security is discounted.

All securities also have a **market value**, particularly on the secondary market. Market value is the price at which a security can be bought or sold.

Net present value (NPV) is the difference between present value and market value (V_0):

$$NPV = \sum_{n=1}^{N} \frac{F_n}{(1+r)^n} - V_0$$

If the net present value of a security is greater than its market value, then it will be worth more in the future than the market has presently valued it at. Therefore, you will probably want to invest in it, i.e. to invest in the upside potential of its value.

If, however, the security's present value is below its market value, then you should sell it at once (as its net present value is negative), for **its market value is sure to diminish**.

2/ … TO ITS FAIR VALUE

If an imbalance occurs between a security's market value and its present value, then efficient markets will seek to re-establish balance and reduce net present value to zero. Investors acting on efficient markets seek out investments offering positive net present value, in order to realise that value. When they do so, they push net present value towards zero, ultimately arriving at the fair value of the security.

> In efficient, fairly valued markets, net present values are zero, i.e. market value (the price) is equal to present value.

3/ APPLYING THE CONCEPT OF NET PRESENT VALUE TO OTHER INVESTMENTS

Up to this point, the discussion has been limited to financial securities. However, the concepts of present value and net present value can easily be applied to any investment, such as the construction of a new factory, the launch of a new product, the takeover of a competing company or any other asset that will generate positive and/or negative cash flows.

The concept of net present value can be interpreted in three different ways:

The value created by an investment – for example, if the investment requires an outlay of €100 and the present value of its future cash flow is €110, then the investor has become €10 wealthier.

The maximum additional amount that the investor is willing to pay to make the investment – if the investor pays up to €10 more, they have not necessarily made a bad deal, as they are paying up to €110 for an asset that is worth €110.

The difference between the present value of the investment (€110) and its market value (€100).

Section 16.4 WHAT DOES NET PRESENT VALUE DEPEND ON?

While net present value is obviously based on the amount and timing of cash flows, it is worth examining how it varies with the discounting rate.

The higher the discounting rate, the more future cash flow is depreciated and, therefore, the lower is the present value. **Net present value declines in inverse proportion to the discounting rate**, thus reflecting investor demand for a greater return (i.e. greater value attributed to time).

Take the following example of an asset (e.g. a financial security or a capital investment) with a market value of 2 and with cash flows as follows:

Year	1	2	3	4	5
Cash flow	0.8	0.8	0.8	0.8	0.8

A 20% discounting rate would produce the following discounting factors:

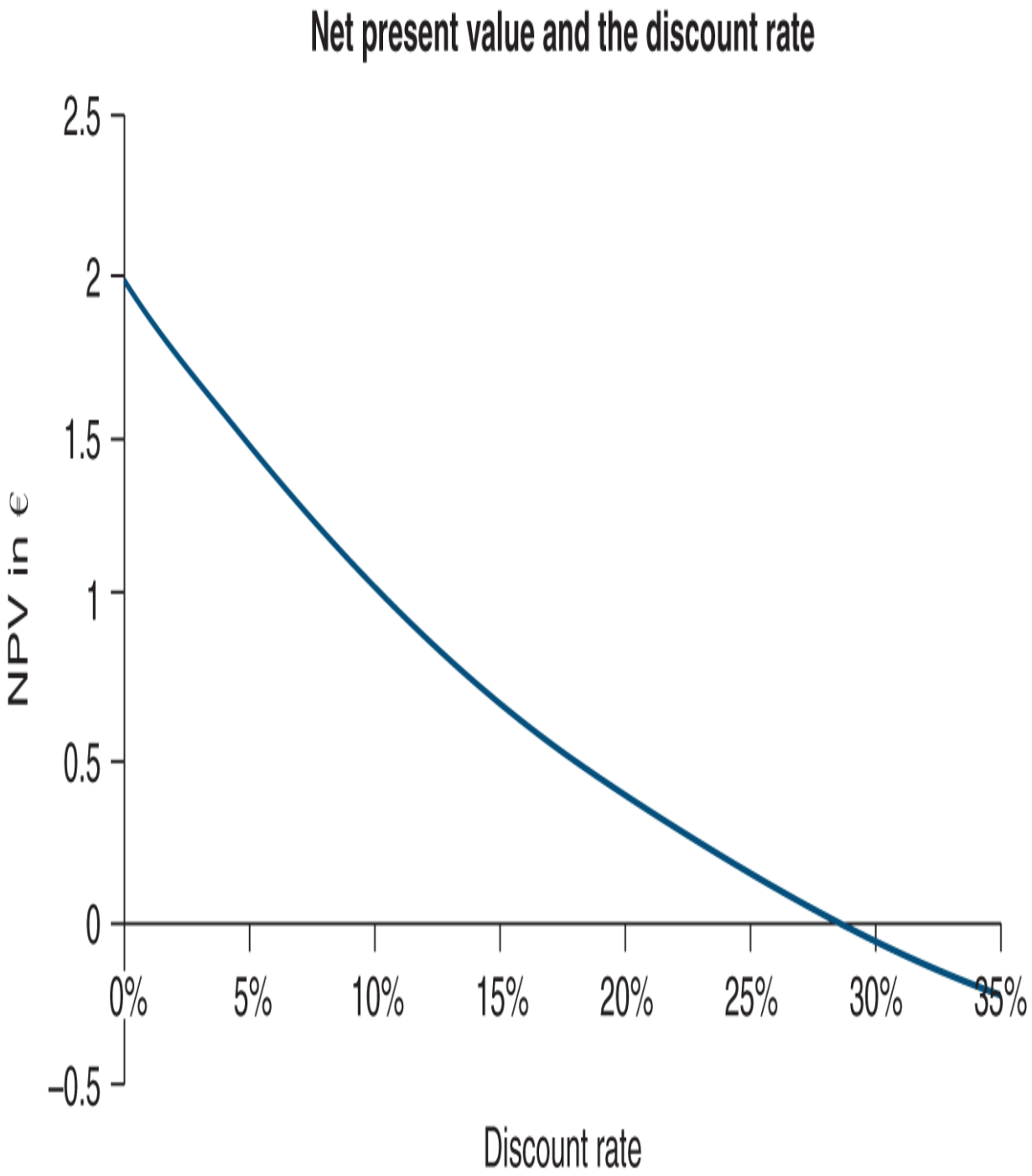
Year	1	2	3	4	5
Discounting factor	0.833	0.694	0.579	0.482	0.402
Present value of cash flow	0.67	0.56	0.46	0.39	0.32

As a result, the present value of this investment is 2.40.[1] As its market value is 2, its net present value is 0.40.

If the discounting rate changes, the following values are obtained:

Discounting rate	0%	10%	20%	25%	30%	35%
Present value of the investment	4	3.03	2.39	2.15	1.95	1.78
Market value	2	2	2	2	2	2
Net present value	2	1.03	0.39	0.15	−0.05	−0.22

Which would then look like this graphically:



The higher the discounting rate (i.e. the higher the return demanded), the lower the net present value.

The present value and net present value of an asset vary in inverse proportion to the discounting rate.

Section 16.5 SOME EXAMPLES OF SIMPLIFICATION OF PRESENT VALUE CALCULATIONS

For those occasions when you are without your favourite spreadsheet program, you may find the following formulas handy in calculating present value.

1/ THE VALUE OF AN ANNUITY *F* OVER *N* YEARS, BEGINNING IN YEAR 1

$$PV = \frac{F}{(1+r)} + \frac{F}{(1+r)^2} + \ldots + \frac{F}{(1+r)^n}$$

or:

$$PV = F\left[\frac{1}{(1+r)} + \frac{1}{(1+r)^2} + \ldots + \frac{1}{(1+r)^n}\right]$$

For the two formulas above, the sum of the geometric series can be expressed more simply as:

$$PV = \frac{F}{r} \times \left[1 - \frac{1}{(1+r)^n}\right]$$

So, if $F = 0.8$, $r = 20\%$ and $n = 5$, then the present value is indeed 2.4.

Further, $\frac{1}{r} \times \left[1 - \frac{1}{(1+r)^n}\right]$ is equal to the sum of the first n discounting factors.

2/ THE VALUE OF A PERPETUITY

A **perpetuity** is a constant stream of cash flows without end. By adding this feature to the previous case, the formula then looks like this:

$$PV = \frac{F}{(1+r)} + \frac{F}{(1+r)^2} + \ldots + \frac{F}{(1+r)^n} + \ldots + \ldots$$

As *n* approaches infinity in the formula of the previous paragraph, this can be shortened to the following:

$$PV = \frac{F}{r}$$

The present value of a €100 perpetuity discounted back at 10% per year is thus:

$$PV = 100/0.10 = \rightarrow 1000$$

A €100 perpetuity discounted at 10% is worth €1,000 in today's euros. If the investor demands a 20% return, then the same perpetuity is worth €500.

3/ THE VALUE OF AN ANNUITY THAT GROWS AT RATE *G* FOR *N* YEARS

In this case, the F_0 cash flow rises annually by *g* for *n* years.

Thus:

$$PV = \frac{F_0 \times (1+g)}{1+r} + \ldots + \left[\frac{F_0 \times (1+g)^n}{(1+r)^n}\right]$$

or:

$$PV = \frac{F_0 \times (1+g)}{r-g} \times \left[1 - \frac{(1+g)^n}{(1+r)^n}\right]$$

Note: the first cash flow actually paid out is $F_0 \times (1 + g)$.

Thus, a security that has just paid out 0.8, and with this 0.8 growing by 10% each year for the four following years, has – at a discounting rate of 20% – a present value of:

$$PV = (0.8 \times (1 + 10\%)/(20\% - 10\%)) \times (1 - (1.10/1.20)^4) = 2.59$$

4/ THE VALUE OF A PERPETUITY THAT GROWS AT RATE *G* (GROWING PERPETUITY)

As *n* approaches infinity, the previous formula can be expressed as follows:

$$PV = \frac{F_0 \times (1 + g)}{r - g} = \frac{F_1}{r - g}$$

As long as $r > g$. The present value is thus equal to the next year's cash flow divided by the difference between the discounting rate and the annual growth rate.

For example, a security with an annual return of 0.8, growing by 10% annually to infinity, has, at a rate of 20%, $PV = 0.8 / (0.2 – 0.1) = 8.0$.

SUMMARY

The summary of this chapter can be downloaded from www.vernimmen.com.

Capitalisation involves foregoing immediate spending of a given sum of money. By using the interest rate at which the money will be invested, the future amounts can be calculated. Thus, the future value of a sum of money can be determined by way of capitalisation.

Discounting involves calculating today's value of a future cash flow, what is known as the *present value*, on the basis of rates of return required by investors. By calculating the present value of a future sum, discounting can be used for comparing future cash flows that will not be received on the same date.

Discounting and capitalisation are two ways of expressing the same phenomenon: the time value of money.

Capitalisation is based on compound interest – $V_n = V_0 \times (1 + r)^n$ – where V_0 is the initial value of the investment, r is the rate of return, n is the duration of the investment in years, $(1 + r)^n$ is the capitalisation factor and V_n is the terminal value.

Discounting is the inverse of capitalisation. It is important to note that any precise financial calculation must account for cash flows at the moment when they are received or paid, and not when they are due.

Net present value is the difference between present value and the value at which the security or share can be bought. Net present value measures the creation or destruction of value that could result from the purchase of a security or making an investment. When markets are in equilibrium, net present values are usually nil.

Changes in present value and net present value move in the opposite direction from changes in discount rates. The higher the discount rate, the lower the present value and net present value, and vice versa.

In many cases, calculating present value and net present value can be made a lot simpler through ad hoc formulas.

QUESTIONS

1/Why should we discount?

2/What is the discount factor equal to?

3/On what should you base a choice between two equal discounted values?

4/What is the simple link between the discount factor and the capitalisation factor?

5/Why are capitalisation factors always greater than 1?

6/Why are discount factors always less than 1?

7/Should you discount even if there is no inflation and no risk? Why?

8/Why does the graph on capitalisation show curves and not lines?

9/Vodafone pays out big dividends. Should its share price rise faster or slower than the share price of Google, which doesn't pay out any dividends? Why? Would it be better to have Vodaphone stock options or Google stock options? Why?

10/What is net present value equal to?

11/The higher the rates of return, the larger present values will be. True or false?

12/What mechanism pushes market value towards present value?

13/Can net present value be negative? What does this mean?

14/What does the discount rate correspond to in formulas for calculating present value and net present value?

15/Are initial flows on an investment more often positive or negative? What about for final cash flows?

16/A market is in equilibrium when present values are nil and net present values are positive. True or false?

17/Can the growth rate to infinity of a cash flow be higher than the discount rate? Why?

18/Could an investment made at a negative net present value result in the creation of value?

19/Would you be more likely to find investments with positive net present value on financial markets or on industrial markets? Why?

20/Which of the formulas in Section 16.5 is more appropriate for valuing: a rented building, the Vodafone share price, a bond?

You'll find more questions at www.vernimmen.com.

EXERCISES

1/What is the present value of €100 received in three years at 5%, 10% and 20%?

2/What is the present value at 10% of €100 received in three years, five years and ten years? What are the discount factors?

3/How much would €1,000 be worth in five years, invested at 5%, 10% and 20%? Why is the sum invested at 20% not double that invested at 10%?

4/How much would €1,000 be worth in 5 years, 10 years and 20 years if invested at 8%? Why is the sum invested for 20 years not double that invested for 10 years?

5/You are keen to obtain a helicopter pilot's licence. A club offers you lessons over two years, with a choice between the following payment terms:

you can either pay the full fees (€10,000) immediately with a 5% discount; or

you can make two equal annual payments, the first one due immediately.

At what interest rate would these two options work out at the same cost?

6/What is the present value at 8% of €100 to be received in three years, five months and 17 days?

7/How much would you have to invest today to have 100 in eight years if the interest rate was 5%? What is the capitalisation factor?

8/At 7%, would you rather have €100 today or €131.1 in four years' time? Why?

9/Show that in order to double your money in one year, the interest rate would have to be around 75%/year.

10/Show that in order to treble your money in *N* years, the interest rate would have to be around 125%/*N*.

11/You are only prepared to forego immediate spending if you get a 9% return on your investment. What would be the top price you would be prepared to pay for a security today that would pay you 121 in two years? If other investors were asking for 8%, what would happen?

12/If instead of throwing his 30 pieces of silver away in 33 AD, Judas had invested them at 3% per annum, how much would his descendants get in 2020? And at 1%? Explain your views.

13/You have the choice between buying a Francis Bacon painting for €100,000, which will be worth €125,000 in four years, and investing in bonds at 6%. What would your choice be? Why?

14/Given the level of risk, you require a 12% return on shares in Snap. No dividends will be paid out for five years. What is the lowest price you could sell them at in four years' time if you bought them for $50 a share today?

15/What is the present value at 10% of a perpetual income of 100? And a perpetual income of 100 rising by 3% every year from the following year?

16/What is the present value at 10% of €100 paid annually for three years? The same question for a perpetual income.

17/An investment promises four annual payments of €52 over the next four years. You require an 8% return. How much would you be prepared to pay for this asset? The share is currently trading at €165. Would you be prepared to buy or to sell? Why? If you buy at that price, how much will you have gained? Will the rate of return on your investment be greater or less than 8%? Why? If you buy at €172, what will your return on this investment be? Why?

18/Show that at 8% there is little difference between the value of a perpetual income and that of a security that offers a constant annual income equal to that of the perpetual income for only 40 years. Show that this will be even more correct if the rate of return is 15%.

19/You have the opportunity to buy the right to park in a given parking place for 75 years at a price of €30,000. You could also rent a parking place for €2,000 a year, revised upwards by 2% every year. If the opportunity cost is 5%, which would you choose?

20/You are the proud owner of the UK TV screening rights for the film *Slumdog Millionaire*. You sell the rights to screen the film on TV once every two years for €0.8m. What is the value of your asset? The film has just been screened. You make the assumption that screenings will be possible for 30 years or in perpetuity. The discount rate is 6%.

21/Your current after-tax annual income is €50,000, which should increase by 4% per year until you retire. You believe that if you interrupt your professional career for two years to do an MBA, you could earn €65,000 after tax per year, with an annual increase of 5% until you retire. What is your present value if you retire in 40 years' time, and the discount rate is 4%? If the total cost of the MBA is €50,000 payable immediately, what is the net present value of this investment? Is it worth doing an MBA?

22/Every year you invest €1,200 for your pension. You started at age 25. How much will you own at 65 if your investment has yielded 4% p.a.? If you wanted to have €200,000, how much would you need to save each year?

23/What is the present value of an investment generating 100 in a year if the discount rate is –0.6% (one year risk-free interest rate in Germany in 2021)?

ANSWERS

Questions

1/*So as to be able to compare a future value and a present value of a future inflow.*

2/$(1 + t)^n$.

3/*If the present values are equal, it makes no difference.*

4/*One is the reverse of the other.*

5/*Because interest rates are positive.*

6/*Because interest rates are positive.*

7/*Yes, because discounting is used to factor in an interest rate which remunerates the foregoing of immediate spending. Discounting is thus unrelated to inflation or risk.*

8/*Because of capitalisation, which every year adds interest earned over the past year to the principal, and interest is earned on this interest in the future. This is called compound interest.*

9/*The Google share price will have to rise more than that of Vodafone in order to make up for the lack of dividends. As stock options are options to buy shares at a fixed exercise price, their value will increase if the share price rises. So it would be better to have Google's stock options.*

10/*The difference between the present value and the market value of an asset.*

11/*False, the opposite is true as the future is more depreciated.*

12/*Arbitrage.*

13/*Yes. The asset has been overvalued.*

14/*The required return on this asset.*

15/*Negative, as we first invest to get positive cash flows in the future; positive.*

16/*False, the opposite is true. NPV = 0 and PV > 0.*

17/*No, because growth is not a process that can continue endlessly!*

18/*No, unless you've made an error in your calculations of the cash flows or underestimated them.*

19/*In industrial markets because arbitrage operations take longer to execute than in financial markets (building a factory takes longer than buying a share) and, therefore, disequilibrium is more frequent.*

20/*The perpetuity for the rented building, the growing perpetuity for Vodafone, the value of an annuity for N years for the coupons of the bond.*

Exercises

A detailed Excel version of the solutions is available at www.vernimmen.com.

1/*100/1.05^3 = €86.4; 100/1.1^3 = €75.1; 100/1.2^3 = €57.9.*

2/*€75.1; €62.1; €38.6; 0.751; 0.621; 0.386.*

3/*€1,276, €1,611, €2,488. Because the principal (€1,000) remains the same and interest more than doubles as a result of the process of compound interest.*

4/*€1,469, €2,159 and €4,661. Because the principal (€1,000) remains the same and interest more than doubles as a result of the process of compound interest.*

5/*11.1% per year.*

6/*€76.6 as three years, five months and 17 days equals 3.463 years and 100/1.08$^{3.463}$ = 76.6.*

7/*€67.7; €1.48.*

8/*It makes absolutely no difference, because €100 capitalised at 7% a year would be worth €131.1 in four years.*

9/*This is a good estimate. Over five years, a sum doubles at 14.87%, and 75%/5 = 15%.*

10/*This is a good estimate. Over five years, a sum trebles at 24.57%, and 125%/5 = 25%.*

11/*At 101.8 other investors are prepared to pay 103.7 and you cannot buy this security.*

12/*9.94 × 10^{26} pieces of silver (994 million billion billion pieces of silver!). Although mathematically possible, Judas's descendants would be unlikely to get anything at all, given the wars, revolutions, periods of inflation, state bankruptcies, etc. that have occurred since 33 AD! It would be "only" 11.7 billion at a 1% interest rate, hence 8.5 × 10^{16} less for an interest rate only 3 times lower. Over a very long period, a small change in return creates huge differences.*

13/*€100,000 at 6% will be worth €126,248 in four years, which is more than €125,000, but if you're an art lover, it might be worth foregoing €1,248 for the pleasure of admiring a Francis Bacon in the comfort of your own home for four years. There's more to life than money!*

14/$50 \times 1.12^4 = €78.7$.

15/*1,000; 1,429.*

16/*€248.7; €1,000.*

17/*€172. Buy, because its present value is higher than its market value. €7. Greater than 8%, because at 8% it is worth €172, so if I buy at €165, I'll earn more. 8%.*

18/*With income of 100, you get: 1,250 and 1,192, a difference of 5%. At 15%: 666.7 and 664.2, a difference of 0.4%. Barring other factors, income over a period exceeding 40 years no longer has a significant impact on present value.*

19/*€2,000 over 75 years growing at 2% would be worth €59,086, so it would be better to buy.*

20/*€5.34m, €6.47m.*

21/*€1,923,077, €662,470, yes.*

22/*€119,791, 6.04%, €2,003 p.a.*

23/*100.6. We find ourselves in a paradoxical situation where 1 euro today is worth more than 1 euro tomorrow.*

BIBLIOGRAPHY

There are a number of financial calculation workbooks available which will help you get to grips with discounting calculations. For example:

W. Makgwale, *Financial Mathematics Made Easy*, TNL Publishers, 2012.

NOTE

1 *0.67 + 0.56 + 0.46 + 0.39 + 0.32 = 2.40.*

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Chapter 17
THE INTERNAL RATE OF RETURN

A well-deserved return

If net present value (NPV) is inversely proportional to the discounting rate, then there must exist a discounting rate that makes NPV equal to zero.

> The discounting rate that makes net present value equal to zero is called the internal rate of return (IRR) or yield to maturity.

To apply this concept to capital expenditure, simply replace “yield to maturity” by “IRR”, as the two terms mean the same thing. It is just that one is applied to financial securities (yield to maturity) and the other to capital expenditure (IRR).

Section 17.1 CALCULATING YIELD TO MATURITY

To calculate yield to maturity, make *r* the unknown and simply use the NPV formula again. The rate *r* is determined as follows:

$$NPV = \sum_{n-1}^{N} \frac{F_n}{(1+r)^n} - V_0$$

To use the same example from Section 16.4:

$$\frac{0.8}{(1+r)} + \frac{0.8}{(1+r)^2} + \ldots + \frac{0.8}{(1+r)^5} = 2$$

In other words, an investment's yield to maturity is the rate at which its market value is equal to the present value of the investment's future cash flows.

In our illustration, the IRR is about 28.6% (see figure in Section 16.4).

Section 17.2 YIELD TO MATURITY AS AN INVESTMENT CRITERION

The yield to maturity is frequently used in financial markets because it represents for the investor the return to be expected for a given level of risk, which they can then compare to their required return rate, thereby simplifying the investment decision.

The decision-making rule is very simple: if an investment's yield to maturity is higher than the investor's required return, they will make the investment or buy the security. Otherwise, they will abandon the investment or sell the security.

In our example, since the yield to maturity (28.6%) is higher than the return demanded by the investor (20%), they should make the investment. If the market value of the same investment were 3 (and not 2), the yield to maturity would be 10.4%, and they should not invest.

> An investment is worth making when its yield to maturity is equal to or greater than the investor's required return. An investment is not worth making when its yield to maturity is below the investor's required return.

Hence, at fair value, the yield to maturity is identical to the market's required return. In other words, net present value is nil (this will be developed further in Chapter 26).

Section 17.3 THE LIMITS OF YIELD TO MATURITY OR IRR

With this new investment-decision-making criterion, it is now necessary to consider how IRR can be used vis-à-vis net present value. It is also important to investigate whether or not these two criteria could somehow produce contradictory conclusions.

If it is a simple matter of whether or not to buy into a given investment, or whether or not to invest in a project, then the two criteria produce exactly the same result, as shown in the example.

If the cash flow schedule is the same, then calculating the NPV by choosing the discounting rate and calculating the internal rate of return (and comparing it with the discounting rate) are two sides of the same mathematical coin.

The issue is, however, a bit more complex when it comes to choosing between several securities or projects, which is usually the case. Comparing several streams of cash flows (securities) should make it possible to choose between them.

1/ THE REINVESTMENT RATE AND THE MODIFIED IRR (MIRR)

Consider two investments *A* and *B*, with the following cash flows:

Year	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Investment *A*	6	0.5					
Investment *B*	2	3	0	0	2.1	0	5.1

At a 5% discount rate, the present value of investment *A* is 6.17 and that of investment *B* is 9.90. If investment *A*'s market value is 5, its net present value is 1.17. If investment *B*'s market value is 7.5, its net present value is 2.40.

Now calculate the IRR. It is 27.8% for investment *A* and 12.7% for investment *B*. Or, to sum up:

	NPV at 5%	**IRR%**

	NPV at 5%	IRR%
Investment *A*	1.17	27.8
Investment *B*	2.40	12.7

Investment *A* delivers a rate of return that is much higher than the required return (27.8% vs. 5%) during a short period of time. Investment *B*'s rate of return is much lower (12.7% vs. 27.8%), but is still higher than the 5% required return demanded and is delivered over a far longer period (seven years vs. two). Our NPV and internal rate of return models are telling us two different things. So, should we buy investment *A* or investment *B*?

At first glance, investment *B* would appear to be the more attractive of the two. Its NPV is higher and it creates the most value: 2.40 vs. 1.17.

However, some might say that investment *A* is more attractive, as cash flows are received earlier than with investment *B* and therefore can be reinvested sooner in high-return projects. While that is theoretically possible, it is the strong (and optimistic) form of the theory because competition among investors and the mechanisms of arbitrage tend to move net present values towards zero. Net present values moving towards zero means that exceptional rates of return converge towards the required rate of return, thereby eliminating the possibility of long-lasting high-return projects.

Given the convergence of the exceptional rates towards required rates of return, it is more reasonable to suppose that cash flows from investment *A* will be reinvested at the required rate of return of 5%. The exceptional rate of 27.8% is unlikely to be recurrent.

And this is exactly what happens if we adopt the NPV decision rule. The NPV in fact assumes that the reinvestment of interim cash flows is made at the required rate of return. The IRR assumes that the reinvestment rate of interim cash flows is simply the IRR itself. However, in equilibrium, it is unreasonable to think that the company can continue to invest at the same rate of the (sometimes) exceptional IRR of a specific project. Instead, it is much more reasonable to assume that, at best, the company can invest at the required rate of return.

However, a solution to the reinvestment rate problem of IRR is the **modified IRR (MIRR)**.

> MIRR is the rate of return that yields an NPV of zero when the initial outlay is compared with the terminal value of the project's net cash flows reinvested at the required rate of return.

So, by capitalising cash flow from investments *A* and *B* at the required rate of return (5%) up to period 7, we obtain from investment *A* in period 7: $6 \times 1.005^6 + 0.5 \times 1.05^5$, or 8.68. From investment *B* we obtain $2 \times 1.05^6 + 3 \times 1.05^5 + 2.1 \times 1.05^2 + 5.1$, or 13.9. The internal rate of return that allows for investment A in capitalising over seven years to reach 8.68 is 8.20%; it is often called modified IRR. For investment B, the modified IRR is 9.24%.

We have thus reconciled the NPV and internal rate of return models.

Some might say that it is not consistent to expect investment *A* to create more value than investment *B*, as only 5 has been invested in *A* vs. 7.5 for *B*. Even if we could buy an additional "half-share" of *A*, in order to equalise the purchase price, the NPV of our new investment in *A* would only be $1.17 \times 1.5 = 1.76$, which would still be less than investment *B*'s NPV of 2.40. For the reasons discussed above, we are unlikely to find another investment with a return identical to that of investment *A*.

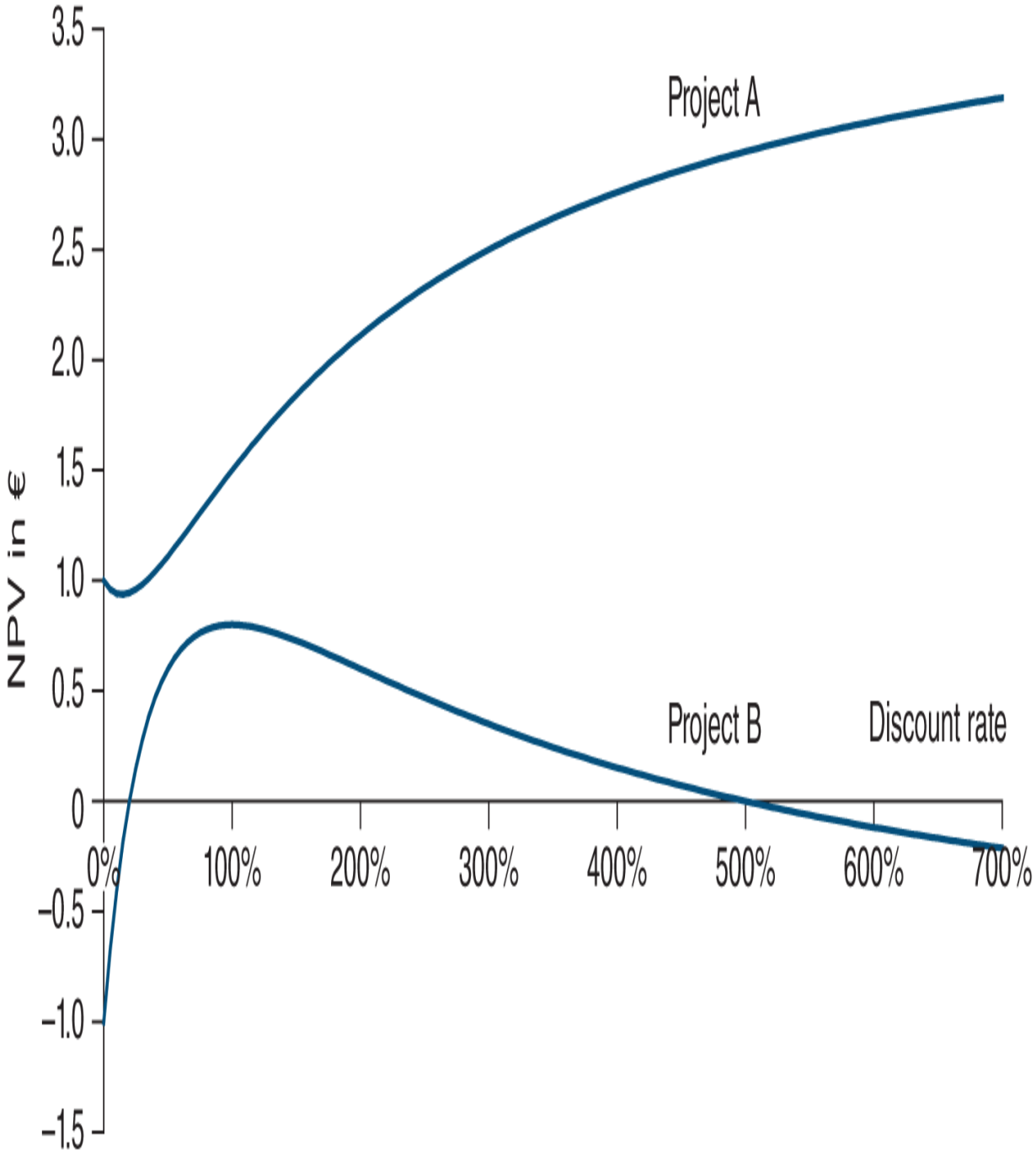
Instead, we should assume that the 2.5 in additional investment would produce the required rate of return (5%) for seven years. In this case, NPV would remain, by definition, at 1.17, whereas the internal rate of return of this investment would fall to 11%. NPV and the internal rate of return would once again lead us to conclude that investment *B* is the more attractive investment.

In fact, the NPV criterion is a better choice criterion than the IRR because it assumes that the intermediate flows of the investment are reinvested at the required rate of return (the discount rate), whereas in the calculation of the IRR they are assumed to be reinvested at that rate. The latter assumption is very strong because, if the IRR is higher than the required rate of return, it assumes that the company will always find projects that yield more than the required rate of return.

2/ MULTIPLE OR NO IRR

Finally, there are some rare cases where the use of the IRR leads to a deadlock. Consider the following investments:

Year	0	1	2
Project A	4	−7	4
Project B	−1	7.2	−7.2



There are two internal rates of return! Which one should we choose? At 10%, the NPV of this investment is 0.40. So it is not worth pursuing, even though its internal rate of return is higher than the required rate of return.

Project A has no IRR. Thus, we have no benchmark for deciding if it is a good investment or not. Although the NPV remains positive for all the

discount rates, it remains only *slightly* positive and the company may decide not to do it.

Project B has two IRRs, and we do not know which is the right one. There is no good reason to use one over the other. Investments with "unconventional" cash flow sequences are rare, but they can happen. Consider a firm that is cutting timber in a forest. The timber is cut, sold and the firm gets an immediate profit. But, when harvesting is complete, the firm may be forced to replant the forest at considerable expense.

> In conclusion, it is not because an investment project has a higher IRR than another that it should be preferred.

The IRR criterion does not allow for the ranking of different investment opportunities. It only allows us to determine whether one project yields at least the return required by investors. When the IRR does not allow us to judge whether an investment project should be undertaken or not (e.g. no IRR or several IRRs), the NPV should be analysed.

Section 17.4 EFFECTIVE ANNUAL RATE, NOMINAL RATES AND PROPORTIONAL RATES

We have just discovered the IRR, but many readers will be more aware of the interest rate, especially those planning to take out a loan. How can we reconcile the two?

Consider someone who wants to lend you €1,000 today at 10% for four years. This 10% means **10% per year** and constitutes the **nominal rate of return** of your loan. This rate will be the basis for calculating interest, proportional to the time elapsed and the amount borrowed. Assume that you will pay interest annually, at the end of each annual period rather than at the beginning.

1/ THE CONCEPT OF EFFECTIVE ANNUAL RATE

Now what happens when interest is paid not once but several times per year?

Suppose that somebody lends you money at 10% but says (somewhere in the fine print at the bottom of the page) that interest will have to be paid on a half-yearly basis. For example, suppose you borrowed €100 on 1 January and then had to pay €5 in interest on 1 July and €5 on 1 January of the following year, as well as the €100 in principal at the same date.

This is not the same as borrowing €100 and repaying €110 one year later. The amount of interest may be the same (5 + 5 = 10), but the payment schedule is not. In the first case, you will have to pay €5 on 1 July (just before leaving on summer holiday), which you could have kept until the following 1 January in the second case. In the first case you pay €5, instead of investing it for six months as you could have done in the second case.

As a result, the loan in the first case costs more than a loan at 10% with interest due annually. Its effective rate is not 10%, since interest is not being paid on the benchmark annual terms.

To avoid comparing apples and oranges, a financial officer must take into account the effective date of disbursement. We know that one euro today is

not the same as one euro tomorrow. Obviously, the financial officer wants to postpone expenditure and accelerate receipts, thereby having the money work for them. So, naturally, the repayment schedule matters when calculating the rate.

Which is the best approach to take? If the interest rate is 10%, with interest payable every six months, then the interest rate is 5% **for six months**. We then have to calculate **an effective annual rate** (and not for six months), which is our point of reference and our constant concern.

Two rates referring to two different maturities are said to be equivalent if the future value of the same amount at the same date is the same with the two rates.

In our example, the lender receives €5 on 1 July which, compounded over six months, becomes 5 + (10% × 5) / 2 = €5.25 on the following 1 January, the date on which they receive the second €5 interest payment. So, over one year, they will have received €10.25 in interest on a €100 investment.

Therefore, the effective annual rate is 10.25%. This is the real cost of the loan, since the return for the lender is equal to the cost for the borrower.

If the apparent rate (or nominal rate) (r_a) is to be paid n times per year, then the effective annual rate (t) is obtained by compounding this nominal rate n times after first dividing it by n:

$$(1 + t) = (1 + r_a/n)^n$$

where n is the number of interest payments in the year and r_a / n the proportional rate during one period, or $t = (1 + r_a / n)^n - 1$.

In our example:

$$t = (1 + 10\%/2)^2 - 1 = 10.25\%$$

The effective interest rate is thus 10.25%, while the nominal rate is 10%.

It should be common sense that an investment at 10% paying interest every six months produces a higher return at year end than an investment paying interest annually. In the first case, interest is compounded after six months and thus produces interest on interest for the next six months. Obviously, a

loan on which interest is due every six months will cost more than one on which interest is charged annually.

> It is essential to first calculate the effective annual rate before comparing investments (or loans) with different cash flow streams. The effective annual rate measures returns on the common basis of a year, thus making meaningful comparisons possible. This is not possible with nominal rates.

The table below gives the returns produced by an investment (a loan) at 10% with varying instalment frequencies:

Interest compounding period	Initial sum	Sum after one year	Effective annual rate (%)
Annual	100	110.000	10.000
Half-year	100	110.250	10.250
Quarterly	100	110.381	10.381
Monthly	100	110.471	10.471
Bimonthly	100	110.494	10.494
Weekly	100	110.506	10.506
Daily	100	110.516	10.516
Continuous[1]	100	110.517	10.517

The effective annual rate can be calculated on any timescale. For example, a financial officer might wish to use continuous rates. This might mean, for example, a 10% rate producing €100, paid out evenly throughout the year on a principal of €1,000. As long as the financial officer is familiar with a rate corresponding to interest paid once a year, they will keep this rate as a reference rate.

By definition, IRR and yields to maturity are effective annual rates.

2/ THE CONCEPT OF PROPORTIONAL RATE

In our example of a loan at 10%, we would say that the 5% rate over six months is **proportional** to the 10% rate over one year. More generally, two

rates are proportional if they are in the same proportion to each other as the periods to which they apply.

For example, 10% per year is proportional to 5% per half-year or 2.5% per quarter, but 5% half-yearly is not equivalent to 10% annually. **Effective annual rate and proportional rates are therefore two completely different concepts that should not be confused.**

> Proportional rates are of interest only when calculating the interest actually paid. In no way can they be evaluated with other proportional rates.

Proportional rates serve only to simplify calculations, but they hide the true cost of a loan. Only the effective annual rate (10.25%/year) gives the true cost, unlike the proportional rate (10%/year).

When the time span between two interest payment dates is less than one year, the proportional rate is lower than the effective annual rate (10% is less than 10.25%). When maturity is more than a year, the proportional rate overestimates the effective annual rate. This is rare, whereas the first case is quite frequent on money markets, where money is lent or borrowed for short periods of time.

> To avoid error, use effective annual rates.

As we will see, the bond market practice can be misleading for the investor focusing on par value: bonds are sold above or below par value, the number of days used in calculating interest can vary, bonds may be repaid above par value, and so on. And, most importantly, on the secondary market, a bond's present value depends on fluctuations in market interest rates.

> In the rest of this book, unless otherwise specified, an interest rate or rate of return is assumed to be an effective annual rate.

Section 17.5 SOME MORE FINANCIAL MATHEMATICS: LOAN REPAYMENT TERMS

The first problem is how and when will you pay off the loan?

Repayment terms constitute the method of amortisation of the loan. Take the following examples.

1/ BULLET REPAYMENT

The entire loan is paid back at maturity.

The cash flow table would look like this:

Period	Principal still due	Interest	Amortisation of principal	Annuity
1	1,000	100	0	100
2	1,000	100	0	100
3	1,000	100	0	100
4	1,000	100	1,000	1,100

Total debt service is the annual sum of interest and principal to be paid back. This is also called debt servicing at each due date.

2/ CONSTANT (OR LINEAR) AMORTISATION

Each year, the borrower pays off a constant proportion of the principal, corresponding to 1/*n*, where *n* is the initial maturity of the loan.

The cash flow table would look like this:

Period	Principal still due	Interest	Amortisation of principal	Annuity
1	1,000	100	250	350
2	750	75	250	325
3	500	50	250	300
4	250	25	250	275

3/ EQUAL INSTALMENTS

The borrower may want to allocate a fixed sum to the service of debt (capital repayment and interests).

Based on the discounting method described previously, consider a constant annuity *A*, such that the sum of the four discounted annuities is equal to the present value of the principal, or €1,000:

$$1{,}000 = \frac{A}{1.10} + \frac{A}{(1.10)^2} + \ldots + \frac{A}{(1.10)^5}$$

This means that the NPV of the 10% loan is nil; in other words, the 10% nominal rate of interest is also the internal rate of return of the loan.

Using the formula from Section 16.5, paragraph 1, the previous formula can be expressed as follows:

$$1{,}000 = \frac{A}{0.10} \times \left(1 - \frac{1}{(1.10)^5}\right)$$

A = €315.47. Hence, the following repayment schedule:

Period	Principal still due	Interest	Amortisation of principal	Annuity
1	1,000	100	215.47	315.47
2	784.53	78.45	237.02	315.47
3	547.51	54.75	260.72	315.47
4	286.79	28.68	286.79	315.47

In this case, the interest for each period is indeed equivalent to 10% of the remaining principal (i.e. the nominal rate of return) and the loan is fully paid off in the fourth year. Internal rate of return and nominal rate of interest are identical, as calculation is on an annual basis and the repayment of principal coincides with the payment of interest.

Regardless of which side of the loan you are on, both work the same way. We start with invested (or borrowed) capital, which produces income (or incurs interest costs) at the end of each period. Eventually, the loan is then either paid back (leading to a decline in future revenues or in interest to be

paid) or held on to, thus producing a constant flow of income (or a constant cost of interest).

4/ INTEREST AND PRINCIPAL BOTH PAID WHEN THE LOAN MATURES

In this case, the borrower pays nothing until the loan matures. The sum that the borrower will have to pay at maturity is none other than the future value of the sum borrowed, capitalised at the interest rate of the loan:

$$V = 1{,}000 \times (1 + 10\%)^5 \quad \text{or} \quad V = 1{,}610.5$$

This is how the repayment schedule would look:

Period	Principal and interest still due	Amortisation of principal	Interest payments	Annuity
1	1,000	0	0	0
2	1,100	0	0	0
3	1,219	0	0	0
4	1,331	1,331	1,331	1,464.1

This is a zero-coupon loan.

SUMMARY

The summary of this chapter can be downloaded from www.vernimmen.com.

As the value of an investment and the discount rate are fundamentally linked, we also looked at the concept of yield to maturity or IRR (which cancels out NPV). Making an investment is only worth it when the IRR is equal to or greater than the investor's required return. At fair value, internal rate of return is identical to the required return rate. In other words, net present value is nil.

The internal rate of return should be handled with care, as it is based on the implicit assumption that intermediate cash flows will be reinvested at the same rate. It should only be relied on for an investment decision concerning a single asset and not for choosing from among several assets. NPV should be used for such decisions.

Finally, some financial mathematics helped us look at the link between the nominal interest rate and the yield to maturity of an operation. The apparent (annual) rate of a loan is the rate used to calculate interest in proportion to the period of the loan and the capital borrowed. However, one must use the yield to maturity, which may differ from the apparent nominal rate, when interest is not paid on an annual basis.

Two rates referring to two different time periods are equivalent if the future value of the same sum is the same at the same date. Finally, two rates are proportional if they are in the same proportion as the maturity to which they refer to. Proportional rates are just a means to compute the interest that is actually to be paid. They have no other use.

QUESTIONS

1/Why can't the internal rate of return be used for choosing between two investments?

2/Does the yield to maturity depend on the terms of repayment of a loan or an investment?

3/Does the yield to maturity depend on when cash flows occur?

4/What are proportional rates?

5/What is the internal rate of return?

6/What are proportional rates used for?

7/On the same loan, is the total amount of interest payable more if the loan is repaid in fixed annual instalments, by constant amortisation or on maturity?

8/If you believe as a borrower that interest rates are going to rise, would you be better off choosing loans that are repayable on maturity or in fixed annual instalments?

9/If the purchase price of an investment is positive and all subsequent cash flows are positive, show how there can only be a single IRR.

10/Is it better to make a small percentage on a very large amount or a large percentage on a small amount? Does this bring to mind one of the rules explained in this chapter?

11/A very high yield to maturity over a very short period is preferable to a yield to maturity that is 2% higher than the required rate of return over 10 years. True or false?

12/Show that the calculation of the IRR assumes the reinvestment of the interim flows from this investment at this rate.

You'll find more questions at www.vernimmen.com.

EXERCISES

1/What interest rate on an investment would turn 120 into 172.8 over two years? What is the IRR? What is the proportional rate over three months?

2/What is the terminal value on an initial investment of 100 if the investor is seeking a 14% yield to maturity after seven years?

3/For how many years will 100 have to be invested to get 174.9 and a yield to maturity of 15%?

4/You invest €1,000 today at 6% with interest paid on a half-yearly basis for four years. What is the effective annual rate of this investment? How much will you have at the end of the four-year period?

5/Investment A can be bought for 4 and will earn 1 per year over six years. What is its IRR? Investment B costs 6 and earns 2 over two years, then 1.5 over three years. What is its IRR? Which investment would you rather have? Why? Do you need to know what the minimum required rate of return is in order to make a decision?

6/A company treasurer invests 100 for 18 months. The first bank they approach offers to reinvest the funds at 0.8% per quarter, and the second bank at 1.6% per half-year. Without actually doing the calculation, show how the first bank's offer would be the best option. What are the two effective annual rates?

7/A company treasurer invests €10,000,000 on the money market for 24 days. They get back €10,019,745. What is the rate of return over 24 days? What is the effective annual rate?

8/Draw up a repayment schedule for a loan of 100, with a yield to maturity of 7% over four years, showing repayment in fixed annual instalments and constant amortisation.

9/Draw up a repayment schedule for a loan of 400, with a yield to maturity of 6.5% over seven years with repayment deferred for two years, showing repayment in fixed annual instalments and constant amortisation.

10/A bond issued at 98% of the nominal value is repaid at maturity at 108% after 10 years. Annual interest paid to subscribers is 7% of the nominal value. What is the yield to maturity of this bond? And what if it had been issued at 101%? Does that remind you of a rule seen in this chapter?

11/What is the discounted cost for the issuer of the bond described in Question 10 if we factor in a 0.35% placement commission, an annual management fee of 2.5% of the coupon, a closing fee of 0.6% of the amount paid and an issue price of 98%?

12/You sell your flat, valued at €300,000, for a down payment of €100,000 and 20 monthly payments of €11,000. What is the monthly interest rate for this transaction? What is the effective annual rate?

13/Calculate the IRR of the following investment, which can be purchased today for 1,000:

Year	**1**	**2**	**3**	**4**	**5**
Cash flow	232	2,088	232	−232	−927

14/Compute the internal rate of return and the modified internal rate of return given a reinvestment rate of 10% for the share in ENS that can be purchased today for 1,000:

Year	**1**	**2**	**3**	**4**	**5**
Cash flow	300	400	100	200	500

ANSWERS

Questions

1/*Because it does not measure the value created which is the prime goal of the investor.*

2/*No, as it is applied at any moment to the remaining capital due.*

3/*Yes, if cash flows are postponed in time, the yield to maturity decreases.*

4/*Rates that have a proportional relationship with the periods to which they relate.*

5/*Rate that applies to different periods, but which transforms the same sum in an identical manner over the same period.*

6/*For calculating the interest that is paid out/earned.*

7/*On maturity, because the principal is lent in full over the whole period and generates interests over a longer period of time.*

8/*On maturity, so that you can take advantage for as long as possible of a low interest rate on the maximum amount of principal outstanding.*

9/*At a discount rate equal to the yield to maturity, the present value of future cash flows is equal to the purchase price of the investment. If the discount rate increases, the present value will drop and will never again be equal to the market price of the investment. If the discount rate decreases, the present value will rise and will never again be equal to the market price of the investment. Accordingly, there is only a single yield to maturity.*

10/*A small percentage on a very large amount. NPV is preferable to IRR.*

11/*False, because an investment with an acceptable yield to maturity over a long period creates more value than an investment with a very high yield to maturity but which is of little significance given the short period of the investment.*

12/*Either a bond with a par value of 100, yielding 8% per year and redeemed at par after three years. Following the IRR, we have*

$$100 = 8/(1 + IRR) + 8/(1+ IRR)^2 + 108/(1+ IRR)^3$$

Multiply each of the terms in the equation by $(1 + IRR)^3$*, where:* $100 \times (1 + IRR)^3 = 8 \times (1 + IRR)^2 + 8 \times (1 + IRR) + 108$.

The right side of the equation corresponds to the reinvestment of interim flows at the IRR rate. This is necessary to obtain the IRR of 8%. Otherwise, if you reinvest the interim cashflows at 0%, then you have cashflows worth 124 at the end of 3 years, which gives you an IRR of 7.43%, not 8%.

Exercises

A detailed Excel version of the solutions is available at www.vernimmen.com.

1/*44% over two years. 20%. 5% over three months.*

2/*250, as* $250 = 100 \times (1+14\%)^{7}$.

3/*Four years, as* $174.9 = 100 \times (1+15\%)^{4}$.

4/*6.09% as* $6.09\% = (1+6\% / 2)^{2} - 1$, *€1,266.7 as* $1{,}000 = (1+6.09\%)^{4}$.

5/*13%, 13.8%, a choice between these two securities cannot be based on yield to maturity. Only NPV can be relied on. Yes, you have to know what the required rate of return is.*

6/*As the rates are proportional (0.8% over three months and 1.6% over six months), the first offer is better, since interest is capitalised after three months and not six months. 3.24% and 3.23%.*

7/*0.1975% over 24 days, 3.05% as* $3.05\% = (1 + 0.1975\%)^{(365/24)}-1$.

8/*Fixed annual instalments of 29.52, constant amortisation of 25/year and interest of 7, 5.25, 3.50 and 1.75.*

9/*Fixed annual instalments of 109.17, constant amortisation of 90.74/year and interest of 29.49, 23.59, 17.69, 11.80 and 5.90.*

10/*7.85% (don't forget interest for year 10), 7.42%, value and rates vary in opposite directions.*

11/*8.12%.*

12/*0.925%, 11.7%.*

13/*There are two: −15.1% and 48.3%.*

14/*14.67%, 12.63%.*

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If you wish to learn more about internal rate of return and financial mathematics, you can consult:

Harvard Business School, *Net Present Value and Internal Rate of Return: Accounting for Time*, Harvard Business School Press, 2009.

E. Pilotte, Evaluating mutually exclusive projects of unequal lives and differing risks, *Financial Practice and Education*, **10**(2), 101–105, Fall/Winter 2000.

NOTE

1 *The formula for continuously compounded interest is* $t = e^k - 1$*, where e stands for 2.71828 and k is an interest rate (10% in our example).*

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PART TWO
THE RISK OF SECURITIES AND THE REQUIRED RATE OF RETURN

After having covered the basics of finance (discounting, capitalisation, value and interest rates), it is time to delve deeper into another fundamental concept: risk. Risk is the uncertainty over future asset values and future returns. For better or for worse, without risk, finance would be quite boring!

Risk means uncertainty today over the cash flows and value of an asset tomorrow. Of course, it is possible to review all the factors that could have a negative or positive impact on an asset, quantify each one and measure the total impact on the asset's value. In reality, it is infinitely more practical to boil all the risks down to a single figure.

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Chapter 18
RISK AND RETURN

The spice of finance

Investors who buy financial securities face risks because they do not know with certainty the future selling price of their securities, nor the cash flows they will receive in the meantime. This chapter will try to explain and measure this risk, and also examine its repercussions.

Section 18.1 SOURCES OF RISK

There are various risks involved in financial securities, including:

Industrial, commercial and labour risks, etc.

There are so many types of risk in this category that we cannot list them all here. They include lack of competitiveness, emergence of new competitors, technological breakthroughs, an inadequate sales network, strikes and so on. These risks tend to lower cash flow expectations and thus have an immediate impact on the value of the stock.

Liquidity risk

This is the risk of not being able to sell an asset at its fair value as a result of either a liquidity discount or the complete absence of a market or buyers.

Credit risk

This is the risk that a creditor will lose their entire investment if a debtor cannot repay them in full, even if the debtor's assets are liquidated. Traders call this **counterparty risk**.

Foreign exchange (FX) risk

Fluctuations in exchange rates can lead to a loss of value of assets denominated in foreign currencies. Similarly, higher exchange rates can increase the value of debt denominated in foreign currencies when translated into the company's reporting currency base.

Interest rate risk

The holder of financial securities is exposed to the risk of interest rate fluctuations. Even if the issuer fulfils their commitments entirely, there is still the risk of a capital loss or, at the very least, an opportunity loss.

Systemic risk

This is the risk of collapse of the overall financial system through the bankruptcy chain and the domino effect linked to the interdependency of market players.

Political risk

This includes risks created by a particular political situation or decisions by political authorities, such as nationalisation without sufficient compensation, revolution, exclusion from certain markets, discriminatory tax policies, inability to repatriate capital, etc.

Regulatory risk

A change in the law or in regulations can directly affect the return expected in a particular sector. Pharmaceuticals, banks and insurance companies, among others, tend to be on the front lines here.

Inflation risk

This is the risk that the investor will recover their investment with a depreciated currency, i.e. that they will receive a return below the inflation rate. A flagrant historical example is the hyperinflation in Germany in the 1920s.

The risk of a fraud

This is the risk that some parties (internal or external) will lie or cheat. The most common examples are insider trading, CEO fraud or ransomware.

Natural disaster risks

These include storms, earthquakes, volcanic eruptions, cyclones, tidal waves, etc., which destroy assets, or of a pandemic that stops the activity or restrains it a lot. The recent past has demonstrated that those risks cannot be neglected.

Economic risk

This type of risk is characterised by bull or bear markets, anticipation of an acceleration or a slowdown in business activity or changes in labour productivity.

The list is nearly endless; however, at this point it is important to highlight two points:

most financial analysis mentioned and developed in this book tends to generalise the concept of risk and highlight its impact on valuations, rather than analysing it in depth. So, given the extent to which markets are efficient and evaluate risk correctly, it is not necessary to redo what others have already done; and

risk is always present. The so-called risk-free rate, to be discussed later, is simply a manner of speaking. **Risk is always present, and to say that risk can be eliminated is either to be excessively confident or to be unable to think about the future – both very serious faults for an investor.**

Obviously, any serious investment study should begin with a precise analysis of the risks involved.

The knowledge gleaned from analysts with extensive experience in the business, mixed with common sense, allows us to classify risks into two categories:

economic risks (political, natural, inflation, fraud and other risks), which threaten cash flows from investments and which come from the “real economy”; and

financial risks (liquidity, currency, interest rate and other risks), which do not directly affect cash flow, but nonetheless do come into the financial sphere. These risks are due to external financial events, and not to the nature of the issuer.

Section 18.2 RISK AND FLUCTUATION IN THE VALUE OF A SECURITY

All of the aforementioned risks can penalise the financial performance of companies and their future cash flows. Obviously, if a risk materialises that seriously hurts company cash flows, then investors will seek to sell their securities. Consequently, the value of the security falls.

Moreover, if a company is exposed to significant risk, then some investors will be reluctant to buy its securities. Even before risk materialises, investors' perceptions that a company's future cash flows are uncertain or volatile will serve to reduce the value of its securities.

Most modern finance is based on the premise that investors seek to reduce the uncertainty of their future cash flows. By its very nature, risk increases the uncertainty of an asset's future cash flow, and it therefore follows that such uncertainty will be priced into the market value of a security.

Investors consider risk only to the extent that it affects the value of the security. Risks can affect value by changing anticipations of cash flows or the rate at which these cash flows are discounted.

To begin with, it is important to realise that in corporate finance no fundamental distinction is made between the risk of asset revaluation and the risk of asset devaluation.

That is to say, whether investors expect the value of an asset to rise (upside) or decrease (downside) is immaterial.[1] It is the fact that risk exists in the first place that is of significance and affects how investors behave.

> All risks, regardless of their nature, lead to fluctuations in the value of a financial security.

Consider, for example, a security with the following cash flows expected for years 1 to 4:

Year	1	2	3	4
Cash flow (in €)	100	120	150	190

Imagine the value of this security is estimated to be €2,000 in five years. Assuming a 9% discounting rate, its value today would be:

$$\frac{100}{1.09} + \frac{120}{1.09^2} + \frac{150}{1.09^3} + \frac{190}{1.09^4} + \frac{2{,}000}{1.09^5} = \rightarrow 1{,}743$$

If a sudden sharp rise in interest rates raises the discounting rate to 13%, the value of the security becomes:

$$\frac{100}{1.13} + \frac{120}{1.13^2} + \frac{150}{1.13^3} + \frac{190}{1.13^4} + \frac{2{,}000}{1.13^5} = \rightarrow 1{,}488$$

The security's value has fallen by 15% whereas cash flows have not changed.

However, if the company comes out with a new product that raises projected cash flow by 20%, with no further change in the discounting rate, the security's value then becomes:

$$\frac{100 \times 1.20}{1.13} + \frac{120 \times 1.20}{1.13^2} + \frac{150 \times 1.20}{1.13^3} + \frac{190 \times 1.20}{1.13^4} + \frac{2{,}000 \times 1.20}{1.13^5} = \rightarrow 1{,}786$$

The security's value increases for reasons specific to the company, not because of a fall of interest rates in the market.

Now, suppose that there is an improvement in the overall economic outlook that lowers the discounting rate to 10%. If there is no change in expected cash flows, the stock's value would be:

$$\frac{120}{1.10} + \frac{144}{1.10^2} + \frac{180}{1.10^3} + \frac{228}{1.10^4} + \frac{2{,}400}{1.10^5} = \rightarrow 2{,}009$$

Again, there has been no change in the stock's intrinsic characteristics and yet its value has risen by 12%.

If there is stiff price competition, then previous cash flow projections will have to be adjusted downward by 10%. If all cash flows fall by the same percentage and the discounting rate remains constant, the value of the company becomes:

$$\rightarrow 2{,}009 \times (1 - 10\%) = \rightarrow 1{,}808$$

Once again, the security's value decreases for reasons specific to the company, not because of a fall in the market.

In the previous example, a European investor would have lost 10% of their investment (from €2,009 to €1,808). If, in the interim, the euro had risen from $1.10 to $1.31, a US investor would have gained 7% (from $2,210 to $2,365).

A closer analysis shows that some securities are more volatile than others, i.e. their price fluctuates more widely. We say that these stocks are “riskier”. **The riskier a stock is, the more volatile its price, and vice versa.** Conversely, the less risky a security is, the less volatile its price, and vice versa.

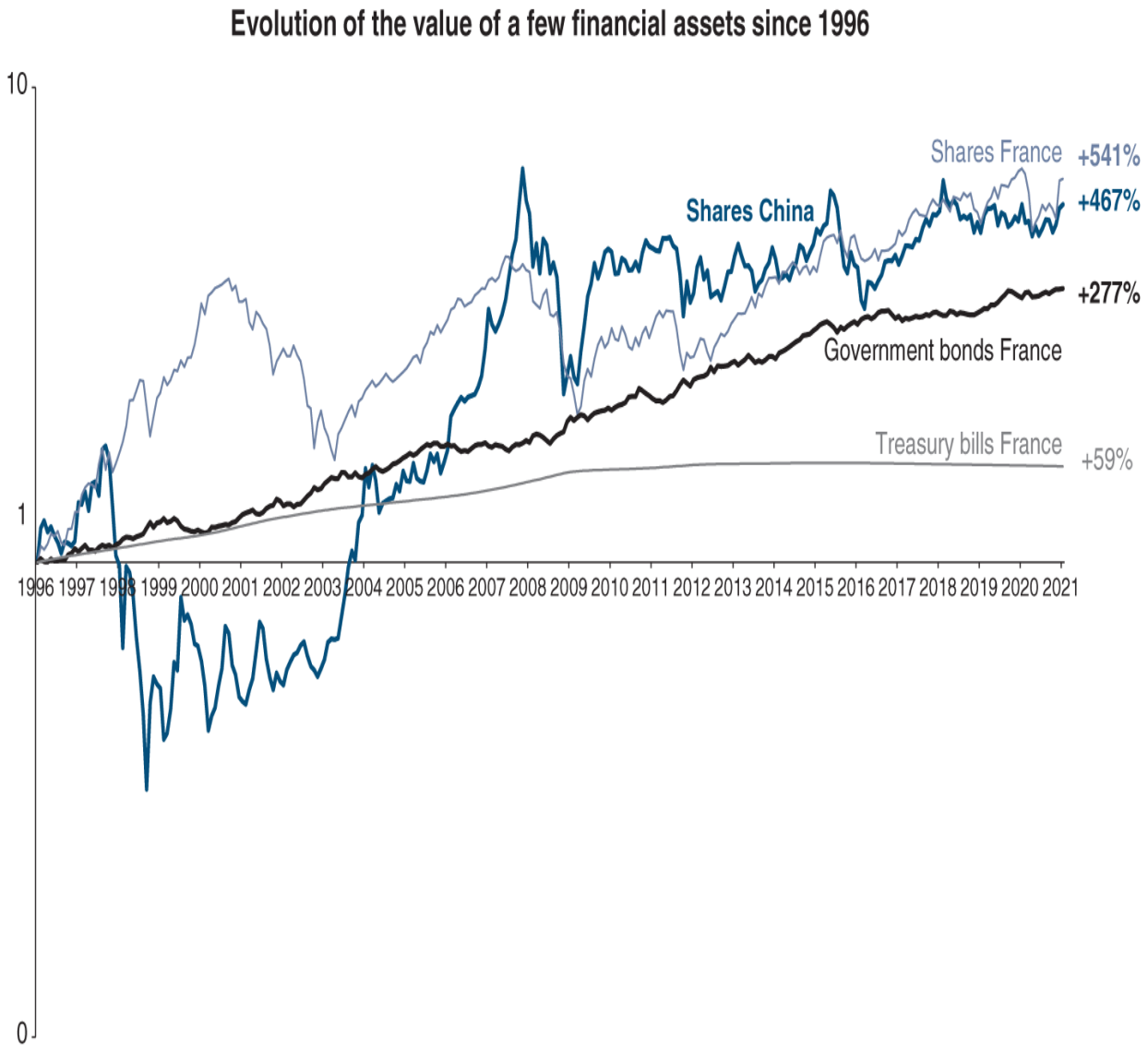
> In a market economy, a security's risk is measured in terms of the volatility of its price (or of its rate of return). The greater the volatility, the greater the risk, and vice versa.

Volatility can be measured mathematically by **variance** and **standard deviation**.

Typically, it is safe to assume that risk dissipates over the long term. The erratic fluctuations in the short term give way to the clear outperformance of equities over bonds, and bonds over money-market investments. The chart below tends to back up this point of view. It presents data on the **path of wealth** (POW) for the three asset classes. The POW measures the growth of €1 invested in any given asset, assuming that all proceeds are reinvested in the same asset.

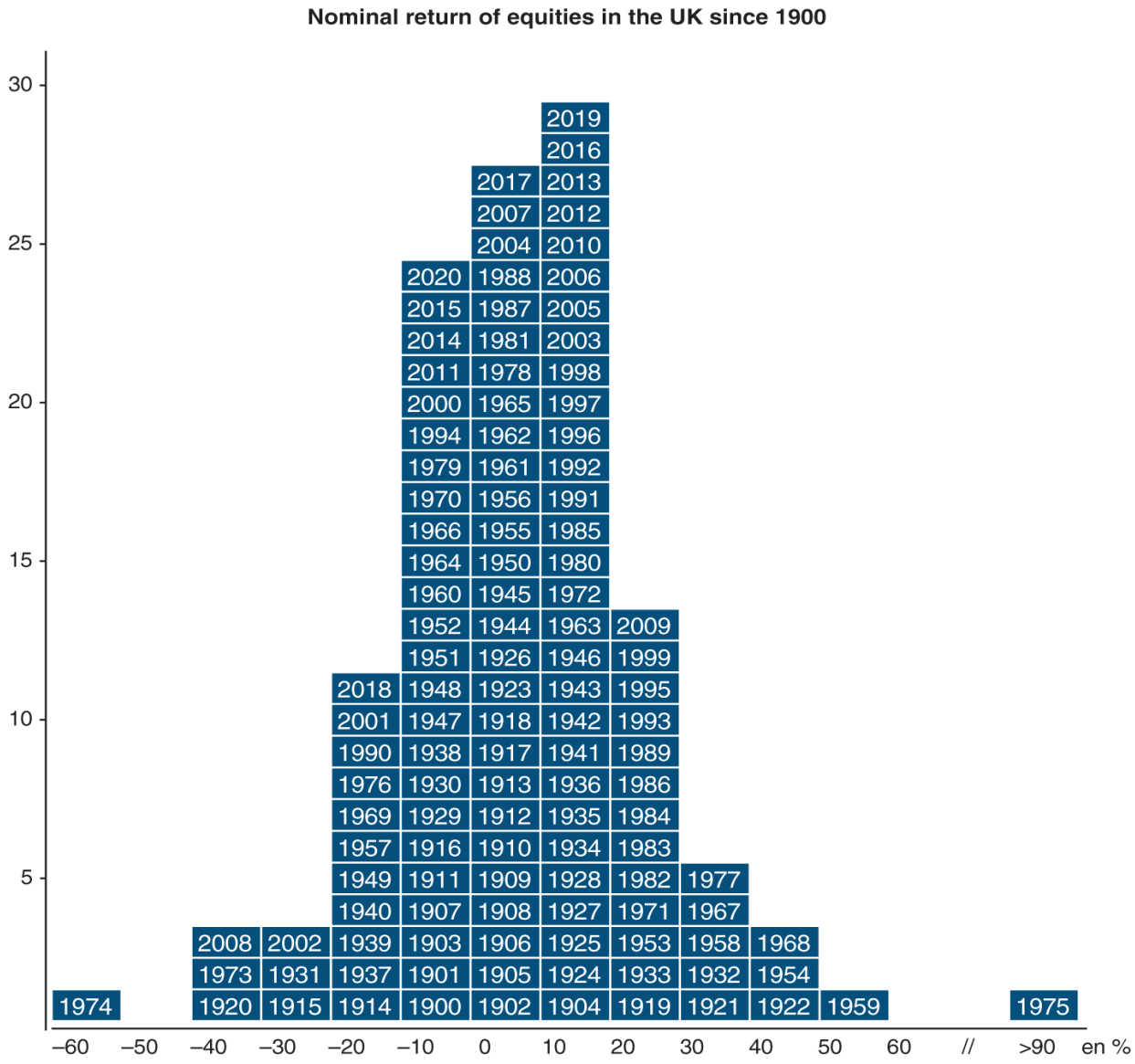
As is easily seen from the chart, risk does dissipate, but only over the long term. In other words, an investor must be able to invest their funds and then do without them during this long-term timeframe. It sometimes requires strong nerves not to give in to the temptation to sell when prices collapse, as happened with stock markets in 1929, 1974, 2001, 2008, or 2011.

Since 1900, UK stocks have delivered an average annual return after inflation of 5.4%. Yet, during 39 of those years the returns were negative, in particular in 1974, when investors lost 57% on a representative portfolio of UK stocks.



Price trends of some financial assets since 1996 showing very different levels of volatility!

Source: Data from Factset



If you are statistically inclined, you will recognise the “Gaussian” or “normal” distribution in this chart, showing the random walk of share prices underlying the theory of efficient markets. Nevertheless, extreme variations are more frequent than in a normal distribution law, which questions the relevancy of this theory.

Source: Based on Dimson, Marsh and Staunton (2020)

And in worst-case scenarios, it must not be overlooked that some financial markets vanished entirely, including the Russian equity market after the 1917 revolution, the German bond market with the hyperinflation of 1921–1923, the Japanese and German equity markets in 1945, and the Chinese equity market in 1949. Over the stretch of one century, these may be exceptional events, but they have enormous repercussions when they do occur.

The degree of risk depends on the investment timeframe and tends to diminish over the long term. Yet rarely do investors have the means and stamina to think only of the long term and ignore short- to medium-term needs. Investors are only human, and there is definitely risk in the short and medium terms!

Section 18.3 TOOLS FOR MEASURING RETURN AND RISK

1/ EXPECTED RETURN

To begin, it must be realised that a security's rate of return and the value of a financial security are actually two sides of the same coin. The rate of return will be considered first.

The holding-period return is calculated from the sum total of cash flows for a given investment, i.e. income, in the form of interest or dividends earned on the funds invested and the resulting capital gain or loss when the security is sold.

If just one period is examined, then the return on a financial security can be expressed as follows:

$$F_1/V_0 + (V_1 - V_0)/V_0 = \text{Income} + \text{Capital gain or loss}$$

Here, F_1 is the income received by the investor during the period, V_0 is the value of the security at the beginning of the period and V_1 is the value of the security at the end of the period.

In an uncertain world, investors cannot calculate their returns in advance, as the value of the security is unknown at the end of the period. In some cases, the same is true for the income to be received during the period.

Therefore, investors use the concept of **expected return**, which is the average of possible returns weighted by their likelihood of occurring. Familiarity with the science of statistics should aid in understanding the notion of expected outcome.

Given security A with 12 chances out of 100 of showing a return of −22%, 74 chances out of 100 of showing a return of 6% and 14 chances out of 100 of showing a return of 16%, its expected return would then be:

$$-22\% \times \frac{12}{100} + 6\% \times \frac{74}{100} + 16\% \times \frac{14}{100}, \quad \text{or about } 4\%$$

More generally, expected return or expected outcome is equal to:

$$\text{Expected return formula } E(r) = \sum_{t=1}^{n} r_t \times p_t = \bar{r}$$

where r_t is a possible return and p_t the probability of it occurring.

2/ STANDARD DEVIATION, A RISK-ANALYSIS TOOL

Intuitively, the greater the risk on an investment, the wider the variations in its return, and the more uncertain that return is. While the holder of a government bond is sure to receive their coupons (unless the government goes bankrupt!), this is far from true for the shareholder of a biotech company. They could lose everything, show a decent return or hit the jackpot.

Therefore, the risk carried by a security can be looked at in terms of the dispersion of its possible returns around an average return. Consequently, risk can be measured mathematically by the variance of its return, i.e. by the sum of the squares of the deviation of each return from expected outcome, weighted by the likelihood of each of the possible returns occurring, or:

$$\text{Risk formula } V(r) = \sum_{t=1}^{n} p_t \times (r_t - \bar{r})^2$$

Standard deviation in returns is the most often used measure to evaluate the risk of an investment. Standard deviation is expressed as the square root of the variance:

$$\sigma(r) = \sqrt{V(r)}$$

The variance of investment A above is therefore:

$$\frac{12}{100} \times (-22\% - 4\%)^2 + \frac{74}{100} \times (6\% - 4\%)^2 + \frac{14}{100} \times (16\% - 4\%)^2$$

where $V(r)$ = 1%, which corresponds to a standard deviation of 10%.

In sum, to formalise the concepts of risk and return:

expected outcome ***E*(*r*)** is a measure of expected return; and

standard deviation **$\sigma(r)$** measures the average dispersion of returns around expected outcome; in other words, risk.

Section 18.4 MARKET AND SPECIFIC RISK

Risk in finance is materialised by fluctuation of value, which is equivalent to fluctuation of returns. Hence, one figure summarises all of the different risks, the knowledge of which does not really matter. Only the impact on value is important.

Fluctuations in the value of a security can be due to:

fluctuations in the entire market. The market could rise as a whole after an unexpected cut in interest rates, stronger-than-expected economic growth figures, etc. All stocks will then rise, although some will move more than others. The same thing can occur when the entire market moves downward; or

factors specific to the company that do not affect the market as a whole, such as a major order, the bankruptcy of a competitor, a new regulation affecting the company's products, a scandal over fraud on product tests, discovering contaminated products, etc.

These two sources of fluctuation produce two types of risk: market risk and specific risk.

Market, systematic or undiversifiable risk is due to trends in the entire economy, tax policy, interest rates, inflation, etc. Remember, this is **the risk of the security correlated to market risk**. To varying degrees, market risk affects all securities. For example, if a nation switches to a 35-hour working week with no adjustment in wages, all companies will be affected. However, in such a case, it stands to reason that textile makers will be affected more than cement companies.

Specific, intrinsic or idiosyncratic risk is independent of market-wide phenomena and is due to factors affecting just the one company, such as mismanagement, a factory fire, an invention that renders a company's main product line obsolete, etc. (In the next chapter, it will be shown how this risk can be eliminated by diversification, a reason why this risk is also sometimes call diversifiable risk.)

Market volatility can be economic or financial in origin, but it can also result from anticipation of flows (dividends, capital gains, etc.) or a variation in the cost of equity. For example, an overheating of the economy could raise the cost of equity (i.e. after an increase in the central bank rate) and reduce anticipated cash flows due to weaker demand. Together, these two factors could exert a double downward pressure on financial securities.

Since market risk and specific risk are independent, they can be measured independently and we can apply Pythagoras's theorem (in more mathematical terms, the two risk vectors are orthogonal) to the overall risk of a single security:

$$(\text{Overall risk})^2 = (\text{Market risk})^2 + (\text{Specific risk})^2$$

The systematic risk presented by a financial security is frequently expressed in terms of its sensitivity to market fluctuations. This is done via a linear regression between periodic market returns (r_{Mt}) and the periodic returns of each security J: r_{Jt}. This yields the regression line expressed in the following equation:

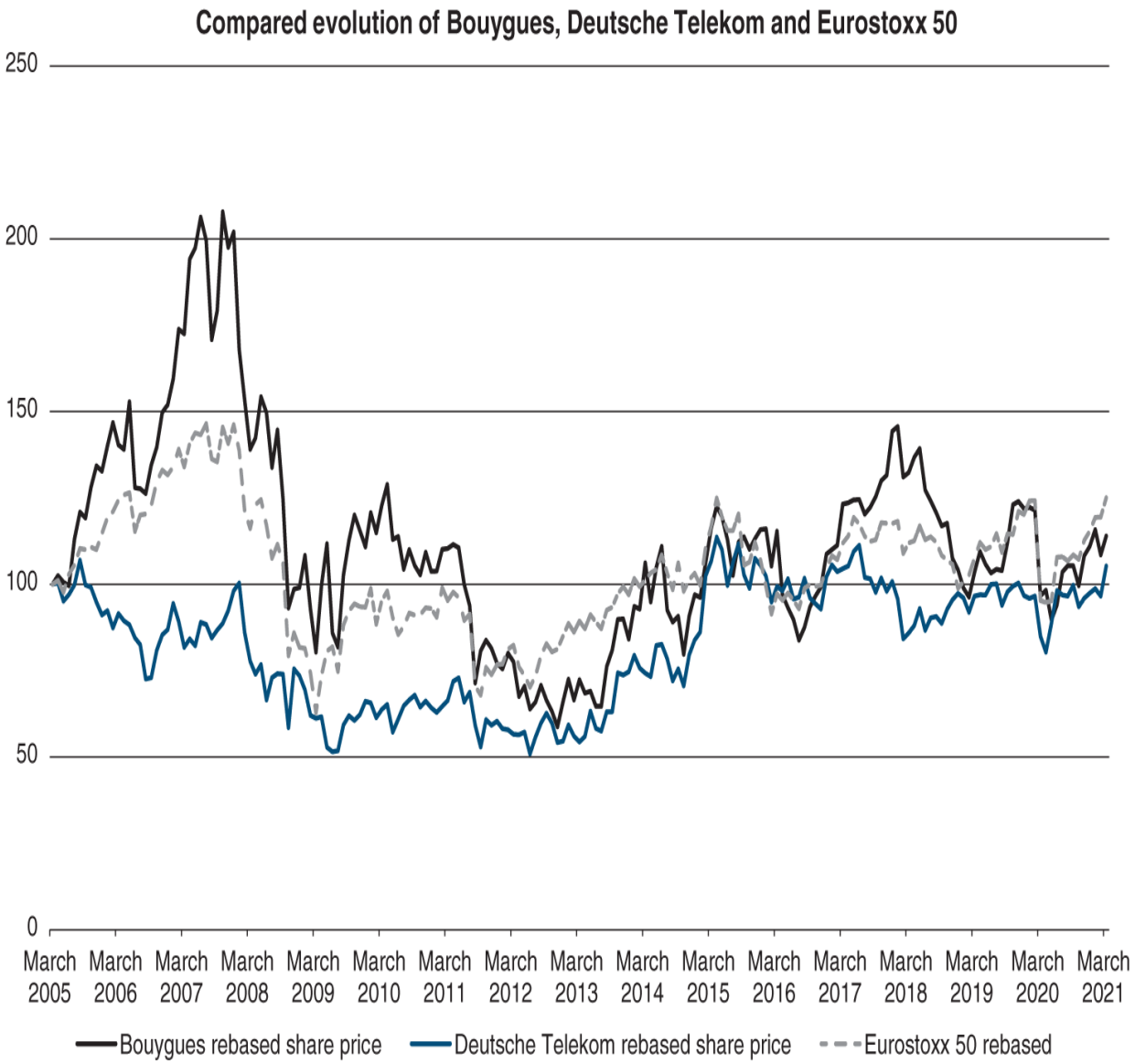
$$r_{J_t} = \alpha_J + \beta_J \times r_{M_t} + \varepsilon_{J_t}$$

β_J is a parameter specific to each investment J and it expresses the relationship between fluctuations in the value of J and the market. It is thus a coefficient of volatility or of sensitivity. We call it the **beta** or the **beta coefficient**.

A security's total risk is reflected in the standard deviation of its return, $s(r_J)$.

A security's **market risk** is therefore equal to $\beta_J \times \sigma(r_M)$, where $\sigma(r_M)$ is the standard deviation of the market return. Therefore it is also proportional to the beta, i.e. the security's market-linked volatility. The higher the beta, the greater the market risk borne by the security. If $\beta > 1$, then the security's returns move at a ratio of greater than 1:1 with respect to the market. Conversely, securities whose beta is below 1 are less affected by market fluctuations.

The **specific risk** of security J is equal to the standard deviation of the different residuals ε_J of the regression line, expressed as $\sigma(\varepsilon_J)$, i.e. the variations in the stock that are not tied to market variations.



This chart shows that the β of Bouygues is higher than that of Deutsche Telekom.

Source: Data from Factset

This can be expressed mathematically as follows:

$$\sigma^2(r_J) = \beta_J^2 \times \sigma^2(r_M) + \sigma^2\,(\varepsilon_J)$$

Section 18.5 THE BETA COEFFICIENT

1/ CALCULATING BETA

β measures a security's sensitivity to market risk. For security J, it is mathematically obtained by performing a regression analysis of security returns versus market returns.

Hence:

$$\beta_J = \frac{\text{Cov}(r_J, r_M)}{V(r_M)}$$

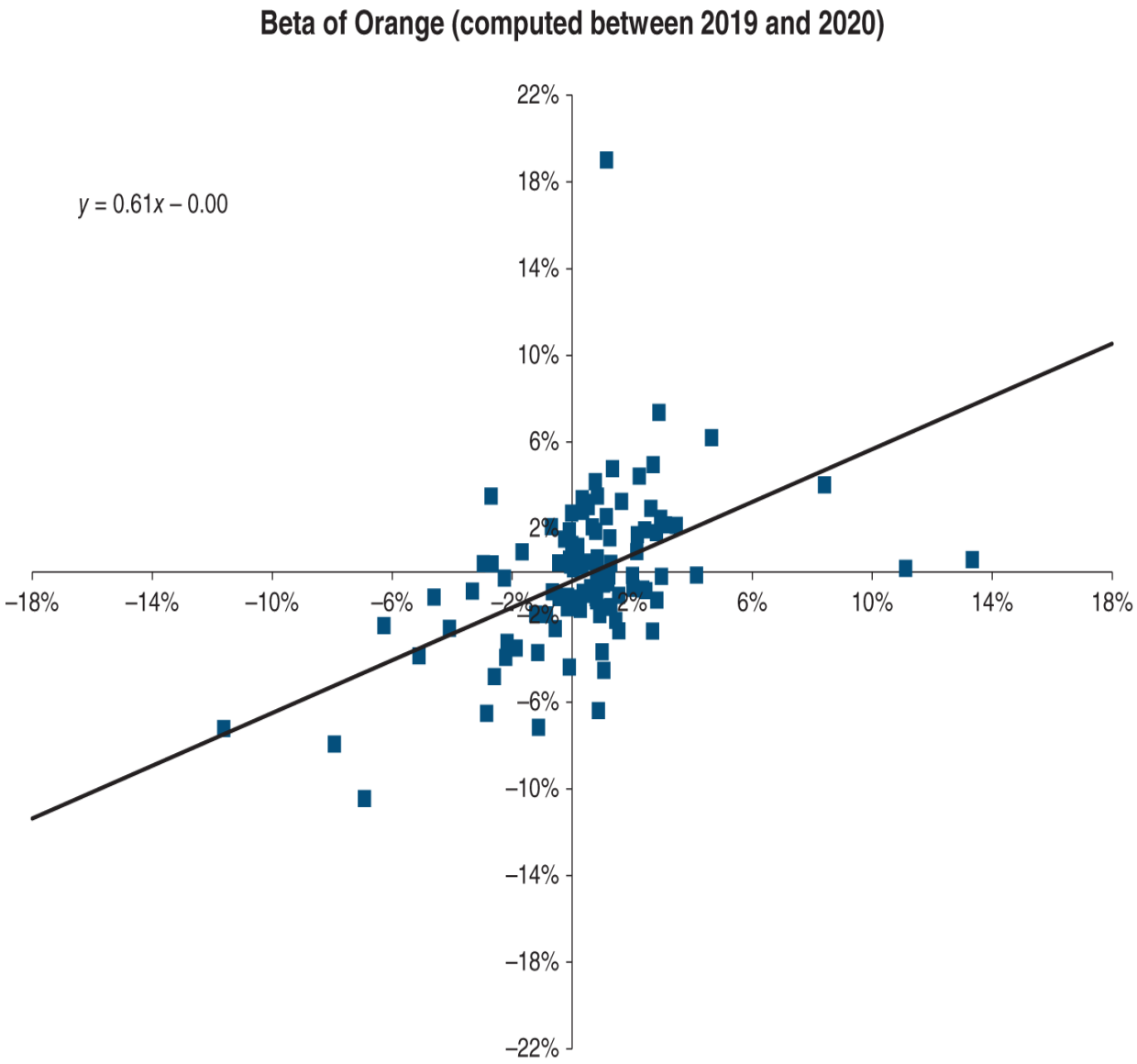
Here, Cov(r_J, r_M) is the covariance of the return of security J with that of the market, and $V(r_M)$ is the variance of the market return. This can be represented as:

$$\beta_J = \frac{\sum_{i=1}^{n}\sum_{k=1}^{n} p_{i,k} \times (r_{J_i} - \bar{r}_J) \times (r_{M_k} - \bar{r}_M)}{\sum_{i=1}^{n} p_i \times (r_{M_i} - \bar{r}_M)^2}$$

More intuitively, β corresponds to the slope of the regression of the security's return versus that of the market. The line we obtain is defined as the **characteristic line** of a security.

As an example, we have calculated the β for Orange and it stands at 0.61.

The β of Orange used to be higher in the late 1990s (1.83). The stock was more volatile than the market, its market risk was high. With the mobile telecom and Internet market maturing, the industry became less risky and the β of Orange is now 1, as shown in the following graph:



Source: Data from Factset

2/ PARAMETERS BEHIND BETA

By definition, the market β is equal to 1. β of fixed-income securities ranges from about 0 to 0.5. The β of equities is usually higher than 0.5, and normally between 0.5 and 1.5. We are not aware of any simple investment products with a negative β, and shares with a β greater than 2 are quite exceptional.

To illustrate, the table below presents betas, as of 2019, of the members of the Euro Stoxx 50 index:

Beta of the Eurostoxx 50									
Linde	0.47	L'Oréal	0.76	SAP	0.92	Siemens	1.07	AXA	1.21
Royal Ahold Delhaize	0.59	Inditex	0.76	AB InBev	0.92	Bayer	1.10	ASML	1.27
Amadeus	0.61	Unilever	0.77	Vivendi	0.92	Telefonica	1.12	Volkswagen	1.35
Danone	0.68	Eni	0.79	Deutsche Post	0.97	Philips	1.12	ING	1.38
Deutsche Telekom	0.68	Adidas	0.81	Total	0.97	Daimler	1.15	BNP Paribas	1.39

Beta of the Eurostoxx 50									
EssilorLuxottica	0.69	Unibail-Rodamco-Westfield	0.82	Fresenius	1.01	Airbus	1.16	Nokia	1.40
Orange	0.72	Munich Re	0.82	Safran	1.03	LVMH	1.17	BBVA	1.42
Sanofi	0.72	Vinci	0.87	Allianz	1.03	Kering	1.18	Société Générale	1.46
Iberdrola	0.75	Engie	0.88	BMW	1.06	Schneider	1.21	Intesa Sanpaolo	1.46
Enel	0.75	Air Liquide	0.91	BASF	1.07	CRH	1.21	Santander	1.56

Source: Factset, 2019

For a given security, the following parameters explain the value of beta:

(a) Sensitivity of the stock's sector to the state of the economy

The greater the effect of the state of the economy on a business sector, the higher its β is – temporary work is one such highly exposed sector. Another example is automakers, which tend to have a β close to 1. There is an old saying in North America, “As General Motors goes, so goes the economy”. This serves to highlight how GM's financial health is to some extent a reflection of the health of the entire economy. Thus, beta analysis can show how GM will be directly affected by macroeconomic shifts.

(b) Cost structure

The greater the proportion of fixed costs to total costs, the higher the breakeven point, and the more volatile the cash flows. Companies that have a high ratio of fixed costs (such as cement makers) have a high β, while those with a low ratio of fixed costs (such as mass-market service retailers) have a low β.

(c) Financial structure

The greater a company's debt, the greater its financing costs. Financing costs are fixed costs which increase a company's breakeven point and, hence, its earnings volatility. The heavier a company's debt or the more heavily leveraged the company is, the higher the β of its shares is.

(d) Visibility on company performance

The quality of management and the clarity and quantity of information the market has about a company will all have a direct influence on its beta. All other factors being equal, if a company gives out little or low-quality information, the β of its stock will be higher as the market will factor the lack of visibility into the share price.

(e) Earnings growth

The higher the forecast rate of earnings growth, the higher the β. Most of a company's value in cash flows is far down the road and thus highly sensitive to any change in assumptions.

Section 18.6 PORTFOLIO RISK

1/ THE FORMULA APPROACH

Consider the following two stocks, Heineken and Criteo, which have the following characteristics:

	Heineken %	Criteo %
Expected return: $E(r)$	6	13
Risk: $\sigma(r)$	10	17

As is clear from this table, Criteo offers a higher expected return while presenting a greater risk than Heineken. Inversely, Heineken offers a lower expected return but also presents less risk.

These two investments are not directly comparable. Investing in Criteo means accepting more risk in exchange for a higher return, whereas investing in Heineken means playing it relatively safe.

Therefore, there is no clear-cut basis by which to choose between Criteo and Heineken. However, the problem can be looked at in another way: **would buying a combination of Criteo and Heineken shares be preferable to buying just one or the other?**

It is likely that the investor will seek to diversify and create a **portfolio** made up of Criteo shares (in a proportion of X_C) and Heineken shares (in a proportion of X_H). This way, they will expect a return equal to the weighted average return of each of these two stocks, or:

$$E(r_{H,C}) = X_H \times E(r_H) + X_C \times E(r_C)$$

where $X_C + X_H = 1$.

Depending on the proportion of Criteo shares in the portfolio (X_C), the portfolio would look like this:

X_C (%)	0	25	33.3	50	66.7	75	100
$E(r_{H,C})$ (%)	6	7.8	8.3	9.5	10.7	11.3	13

The portfolio's variance is determined as follows:

$$\sigma^2(r_{H,C}) = X_H^2 \times \sigma^2(r_H) + X_C^2 \times \sigma^2(r_C) + 2X_H \times X_C \times \text{Cov}(r_H, r_C)$$

where $\text{Cov}(r_H, r_C)$ is the covariance. It measures the degree to which Heineken and Criteo fluctuate together. It is equal to:

$$\begin{aligned}\text{Cov}(r_H, r_C) &= E[(r_H - C(r_H)) \times (r_C - E(r_C))] \\ &= \sum_{i=1}^{n}\sum_{j=1}^{m} p_{i,j} \times (r_{H_i} - \bar{r}_H) \times (r_{C_i} - \bar{r}_C) \\ &= \rho_{H,C} \times \sigma(r_H) \times \sigma(r_C)\end{aligned}$$

Here, $p_{i,j}$ is the probability of joint occurrence and $\rho_{H,C}$ is the correlation coefficient of returns offered by Heineken and Criteo. The correlation coefficient is a number between −1 (where the correlation between returns on the two stocks will be perfectly negative) and 1 (where the correlation between returns on the two stocks will be perfectly positive). Correlation coefficients are usually positive, as most stocks rise together in a bullish market and fall together in a bearish market.

By plugging the variables back into our variance equation above, we obtain:

$$\sigma^2(r_{H,C}) = X_H^2 \times \sigma^2(r_H) + X_C^2 \times \sigma^2(r_C) + 2X_H \times X_C \times \rho_{H,C} \times \sigma(r_H) \times \sigma(r_C)$$

Given that:

$$-1 \leq \rho_{H,C} \leq 1$$

it is therefore possible to say:

$$\sigma^2(r_{H,C}) \leq X_H^2 \times \sigma^2(r_H) + X_C^2 \times \sigma^2(r_C) + 2X_H \times X_C \times \sigma(r_H) \times \sigma(r_C)$$

or:

$$\sigma^2(r_{H,C}) \leq (X_H \times \sigma(r_H) + X_C \times \sigma(r_C))^2$$

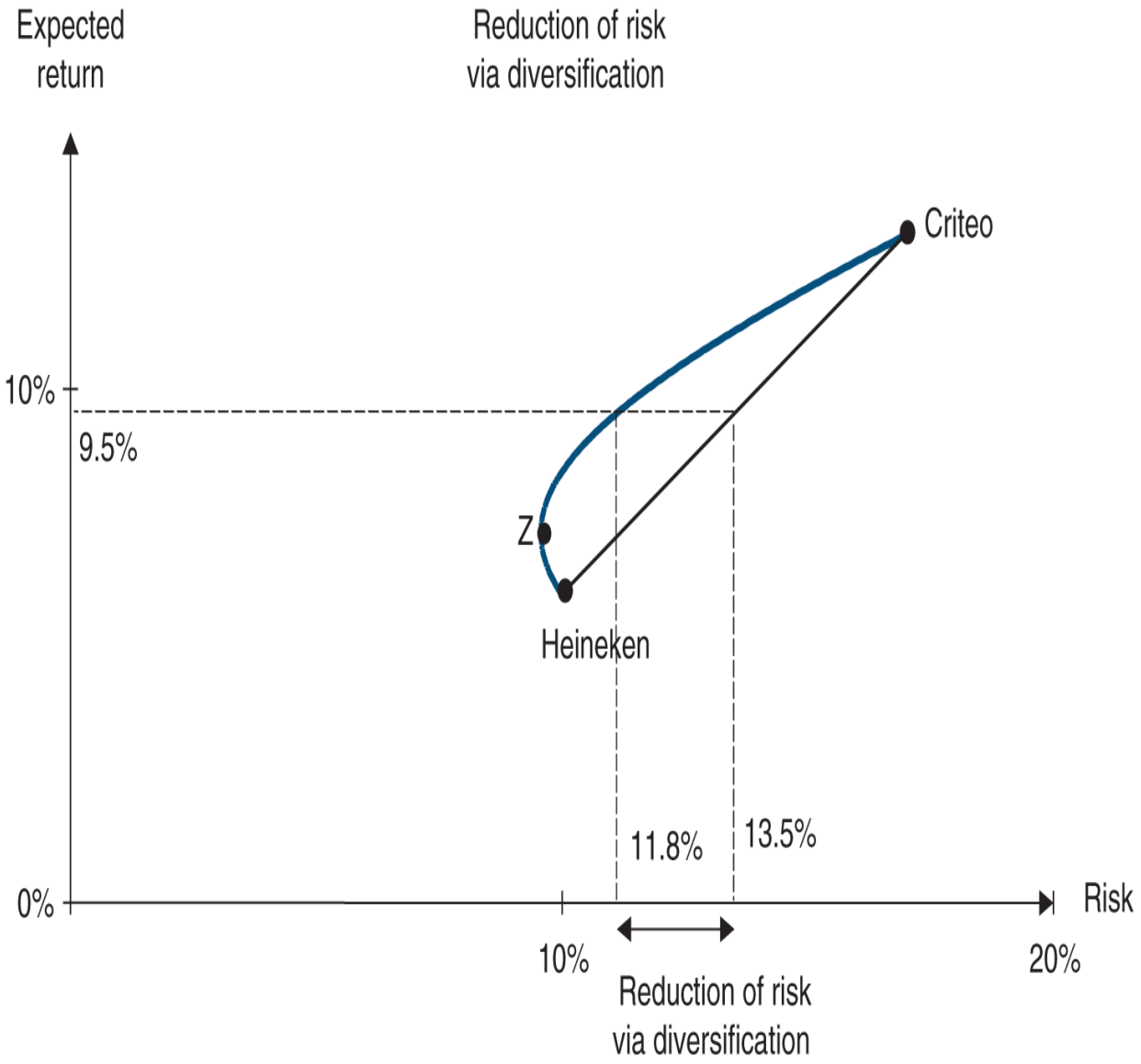
Therefore, the overall risk of a portfolio consisting of Criteo and Heineken shares is less than the weighted average of the risks of the two stocks.

Assuming that $\rho_{H,C}$ is equal to 0.5 (from the figures in the above example), we obtain the following:

X (%)	0	25	33.3	50	66.7	75	100
$\sigma(r_{H,C})$ (%)	10.0	10.3	10.7	11.8	13.3	14.2	17.0

Hence, a portfolio consisting of 50% Criteo and 50% Heineken has a standard deviation of 11.8% or less than the average of Criteo and Heineken, which is (50% × 17%) + (50% × 10%) = 13.5%.

On a chart, it looks like this:



Although fluctuations in Criteo and Heineken stocks are positively correlated with each other, having both together in a portfolio creates a less risky profile than investing in them individually.

Only a correlation coefficient of 1 creates a portfolio risk that is equal to the average of its component risks.

As can be seen in the following table, globalisation has increased correlation among Western markets.

CORRELATION BETWEEN DIFFERENT STOCK MARKETS (2014–2019)

	Brazil	China	France	Germany	Morocco	Switzerland	UK	United States
Brazil	1.00	0.30	0.68	0.67	0.82	0.38	0.72	0.90
China	0.30	1.00	0.66	0.70	0.44	0.52	0.36	0.47
France	0.68	0.66	1.00	0.97	0.78	0.69	0.82	0.84
Germany	0.67	0.70	0.97	1.00	0.84	0.63	0.84	0.83
Morocco	0.82	0.44	0.78	0.84	1.00	0.40	0.83	0.85

	Brazil	China	France	Germany	Morocco	Switzerland	UK	United States
Switzerland	0.38	0.52	0.69	0.63	0.40	1.00	0.54	0.46
UK	0.72	0.36	0.82	0.84	0.83	0.54	1.00	0.77
United States	0.90	0.47	0.84	0.83	0.85	0.46	0.77	1.00

Source: Data from Factset

Emerging markets still bring diversification and are more correlated among themselves than with developed countries.

However, sector diversification is still highly efficient thanks to the low correlation coefficients among different industries:

CORRELATION BETWEEN ECONOMIC SECTORS WORLDWIDE (2014–2019)

Sector	Banks	Automotive	Pharmaceuticals & Biotech	Oil & Gas	Construction	Softwares	Energy	Agriculture & Food chain	Re
Banks	1.00	0.75	0.52	0.35	0.66	0.74	0.26	0.56	
Automotive	0.75	1.00	0.49	0.24	0.43	0.28	0.21	0.31	
Pharmaceuticals & Biotech	0.52	0.49	1.00	−0.20	0.54	0.57	−0.30	0.73	
Oil & Gas	0.35	0.24	−0.20	1.00	−0.25	0.04	0.99	−0.25	−
Construction	0.66	0.43	0.54	−0.25	1.00	0.77	−0.34	0,89	(
Softwares	0.74	0.28	0.57	0.04	0.77	1.00	−0.10	0.78	
Energy	0.26	0.21	−0.30	0.99	−0.34	−0.10	1.00	−0.36	−
Agriculture & Food chain	0.56	0.31	0.73	−0.25	0.89	0.78	−0.36	1.00	
Retailing	0.66	0.24	0.64	−0.03	0.74	0.97	−0.16	0.78	
Metals & Mining	0.71	0.38	0.00	0.79	0.24	0.48	0.72	0.15	
Aerospace & Defence	0.79	0.35	0.56	0.11	0.76	0.99	−0.02	0.76	

Source: Data from Factset

Diversification can:

reduce risk for a given level of return; and/or

improve return for a given level of risk.

Section 18.7 CHOOSING AMONG SEVERAL RISKY ASSETS AND THE EFFICIENT FRONTIER

This section will address the following questions: why is it correct to say that the beta of an asset should be measured in relation to the market portfolio? Above all, what is the market portfolio?

To begin, it is useful to study the impact of the correlation coefficient on diversification. Again, the same two securities will be analysed: Criteo (C) and Heineken (H). By varying $\rho_{H,C}$ between −1 and +1, we obtain:

Proportion of C shares in portfolio (X_C) (%)		**0**	**25**	**33.3**	**50**	**66.7**	**75**	**100**
Return on the portfolio: $E(r_{H,C})$ (%)		6.0	7.8	8.3	9.5	10.7	11.3	13.0
Portfolio risk $\sigma(r_{H,C})$ (%)	$\rho_{H,C} = -1$	10.0	3.3	1.0	3.5	8.0	10.3	17.0
	$\rho_{H,C} = -0.5$	10.0	6.5	6.2	7.4	10.1	11.7	17.0
	$\rho_{H,C} = 0$	10.0	8.6	8.7	9.9	11.8	13.0	17.0
	$\rho_{H,C} = 0.3$	10.0	9.7	10.0	11.1	12.7	13.7	17.0
	$\rho_{H,C} = 0.5$	10.0	10.3	10.7	11.8	13.3	14.2	17.0
	$\rho_{H,C} = 1$	10.0	11.8	12.3	13.5	14.7	15.3	17.0

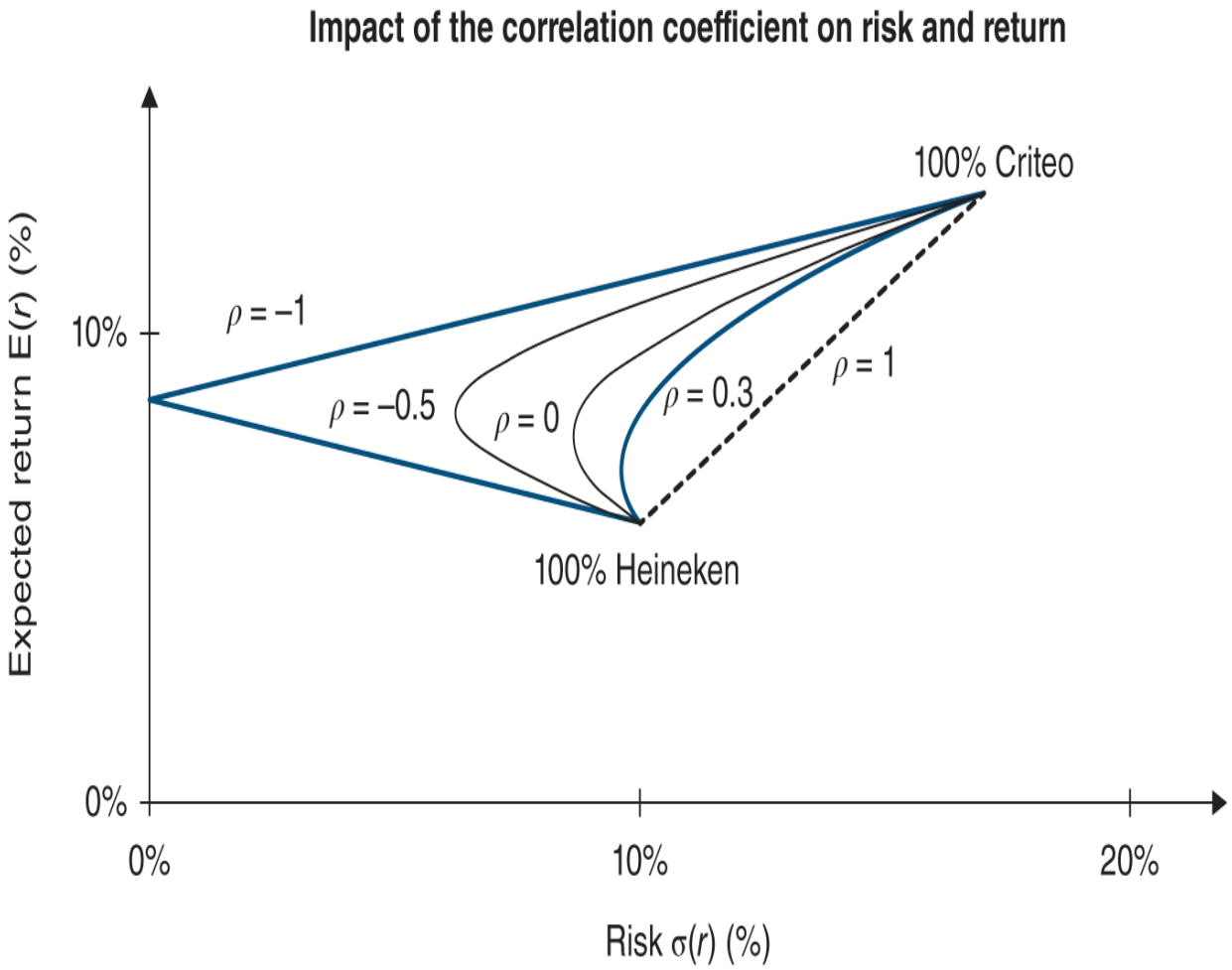
Note the following caveats:

If Criteo and Heineken were perfectly correlated (i.e. the correlation coefficient was 1), then diversification would have no effect. All possible portfolios would lie on a line linking the risk/return point of Criteo with that of Heineken. Risk would increase in direct proportion to Criteo's stock added.

If the two stocks were perfectly inversely correlated (correlation coefficient −1), then diversification would be total. However, there is little chance of this occurring, as both companies are exposed to the same economic conditions.

Generally speaking, Criteo and Heineken are positively, but imperfectly, correlated and diversification is based on the desired amount of risk.

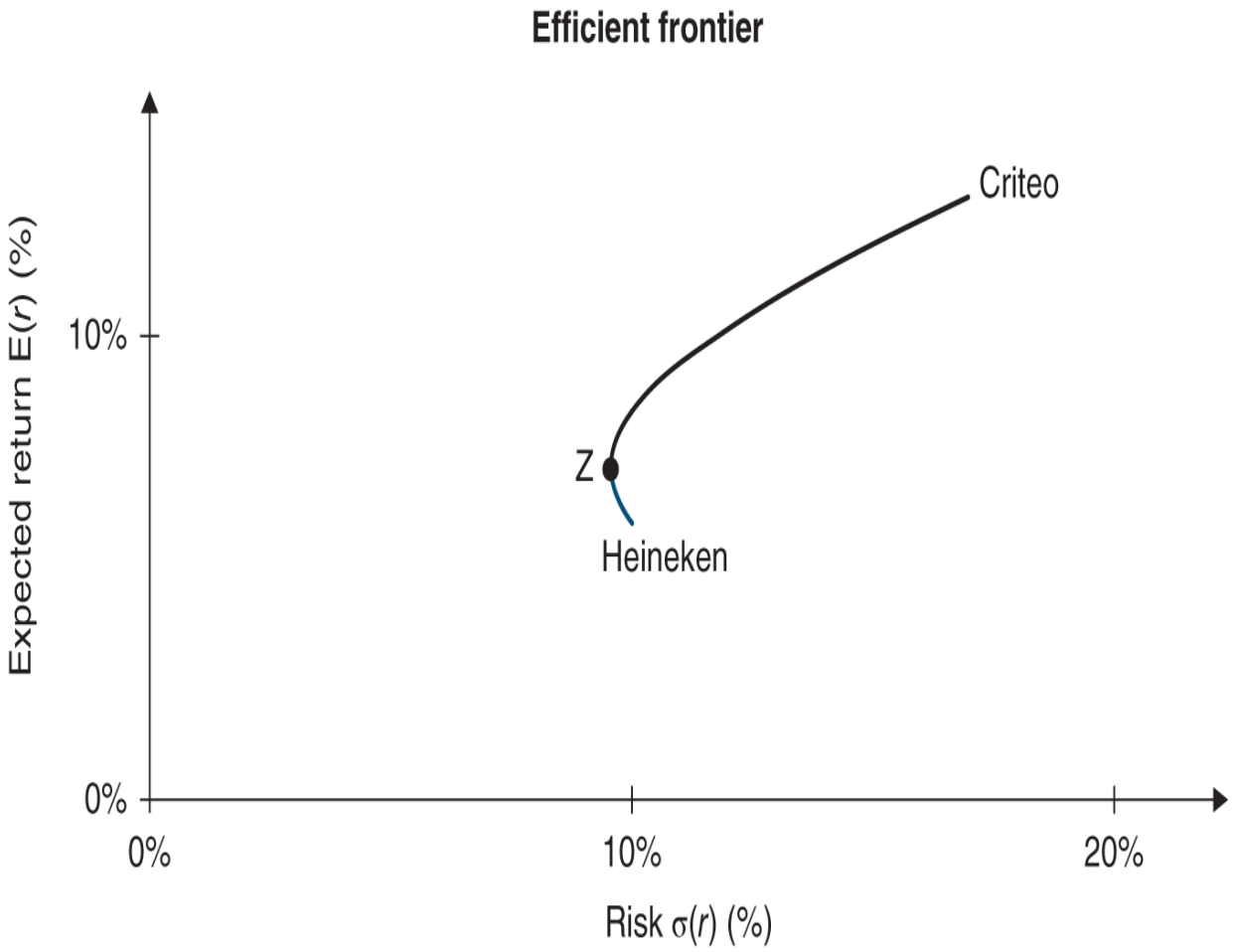
With a fixed correlation coefficient of 0.3, there are portfolios that offer different returns at the same level of risk. Thus, a portfolio consisting of two-thirds Heineken and one-third Criteo shows the same risk (10%) as a portfolio consisting of just Heineken, but returns 8.3% versus only 6% for Heineken.



As long as the correlation coefficient is below 1, diversification will be efficient.

There is no reason for an investor to choose a given combination if another offers a better (efficient) return at the same level of risk.

Efficient portfolios (such as a combination of Criteo and Heineken shares) offer investors the best risk–return ratio (i.e. minimum risk for a given return).

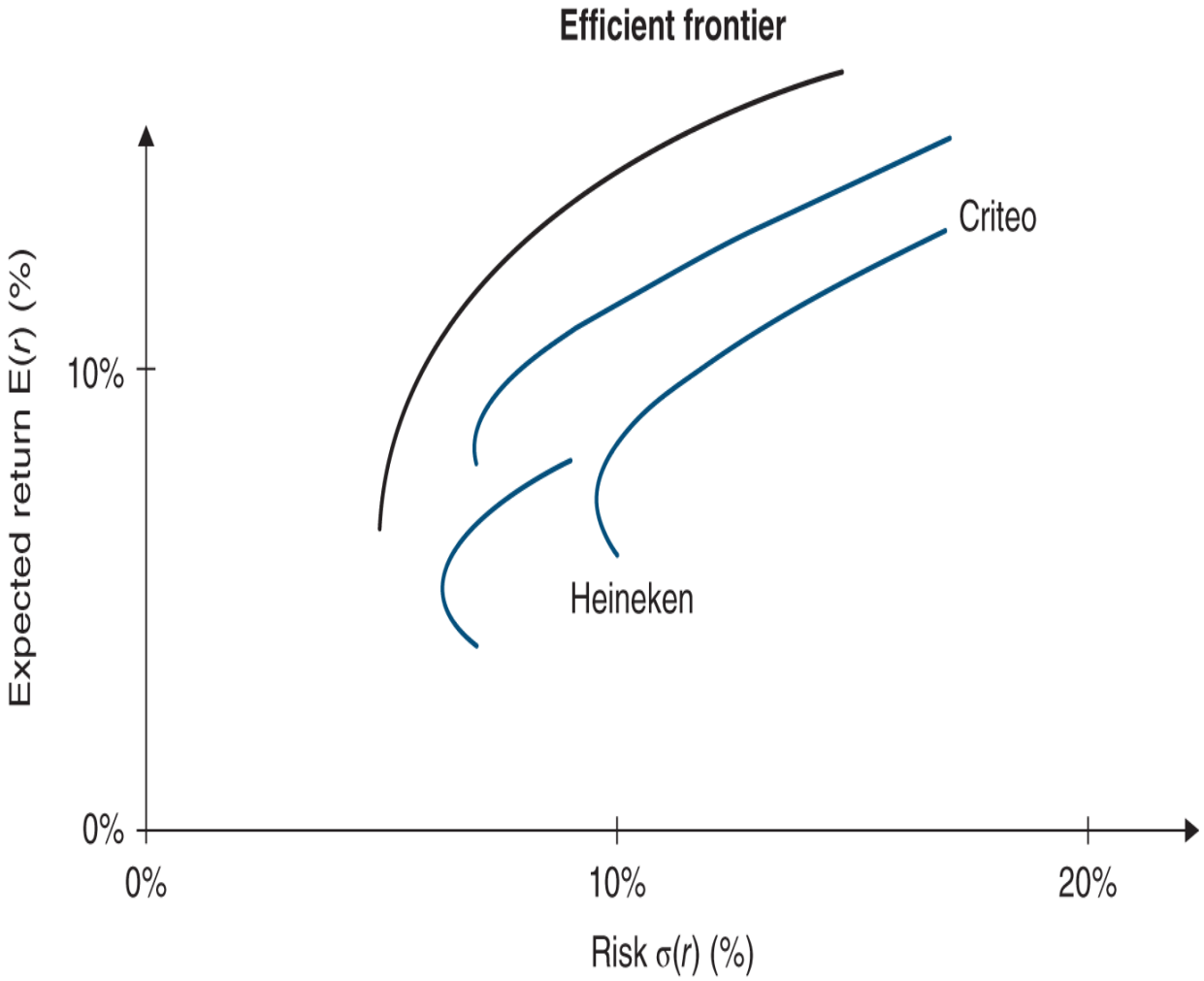


Efficient portfolios fall between Z and Criteo. The portion of the curve between Z and Criteo is called the efficient frontier.

For any portfolio that does not lie on the **efficient frontier**, another can be found that, given the level of risk, offers a greater return or that, at the same return, entails less risk.

> All subjective elements aside, it is impossible to choose between portfolios that have different levels of risk. There is no universally optimum portfolio and therefore it is up to the investor to decide, based upon their appetite for risk. However, given the same level of risk, some portfolios are better than others. These are the efficient portfolios.

With a larger number of stocks, i.e. more than just two, the investor can improve their efficient frontier, as shown in the following chart.


Efficient frontier
Criteo
Heineken
Expected return E(r) (%)
10%
0%
0%
10%
20%
Risk σ(r) (%)

Section 18.8 CHOOSING BETWEEN SEVERAL RISKY ASSETS AND A RISK-FREE ASSET: THE CAPITAL MARKET LINE

1/ RISK-FREE ASSETS

By definition, **risk-free assets are those whose returns**, the risk-free rate (r_F), **are certain**. The standard deviation of their return is thus zero. Traditionally, this is illustrated with government bonds, although we can no longer assume that the government cannot go bankrupt, given the high levels of debt in many countries. This has now led us to view the 1-month Treasury bill as risk-free (e.g. the German bill for the Eurozone, the US Treasury bill for the US).

If a portfolio has a risk-free asset F in proportion $(1 - X_H)$ and the portfolio consists exclusively of Heineken shares, then the portfolio's expected return $E(r_{H,F})$ will be equal to:

$$E(r_{H,F}) = (1 - X_H) \times r_F + X_H \times E(r_H) = r_F + (E(r_H) - r_F) \times X_H$$

The portfolio's expected return is equal to the return of the risk-free asset, plus a risk premium, multiplied by the proportion of Heineken shares in the portfolio. The risk premium is the difference between the expected return on Heineken and the return on the risk-free asset.

How much risk does the portfolio carry? Its risk will simply be the risk of the Heineken stock, commensurate with its proportion in the portfolio, expressed as follows:

$$\sigma(r_{H,F}) = X_H \times \sigma(r_H)$$

If investors want to increase their expected return, they will increase X_H. They could even borrow money at the risk-free rate and use the funds to buy Heineken stock, but the risk carried by their portfolio would rise commensurately.

By combining the previous two equations, we can eliminate X_H, thus deriving the following equation:

$$E(r_{H,F}) = r_F + \frac{\sigma\left(r_{H,F}\right)}{\sigma(r_H)} \times \left[E\left(r_H\right) - r_F\right]$$

This portfolio's expected return is equal to the risk-free rate, plus the difference between the expected return on Heineken and the risk-free rate. This difference is weighted by the ratio of the portfolio's standard deviation to Heineken's standard deviation.

Continuing with the Heineken example, and assuming that r_F is 3%, with 50% of the portfolio consisting of a risk-free asset, the following is obtained:

$$E(r_{H,F}) = 3\% + (6\% - 3\%) \times 0.5 = 4.5\%$$

$$\sigma(r_{H,F}) = 0.50 \times 10\% = 5\%$$

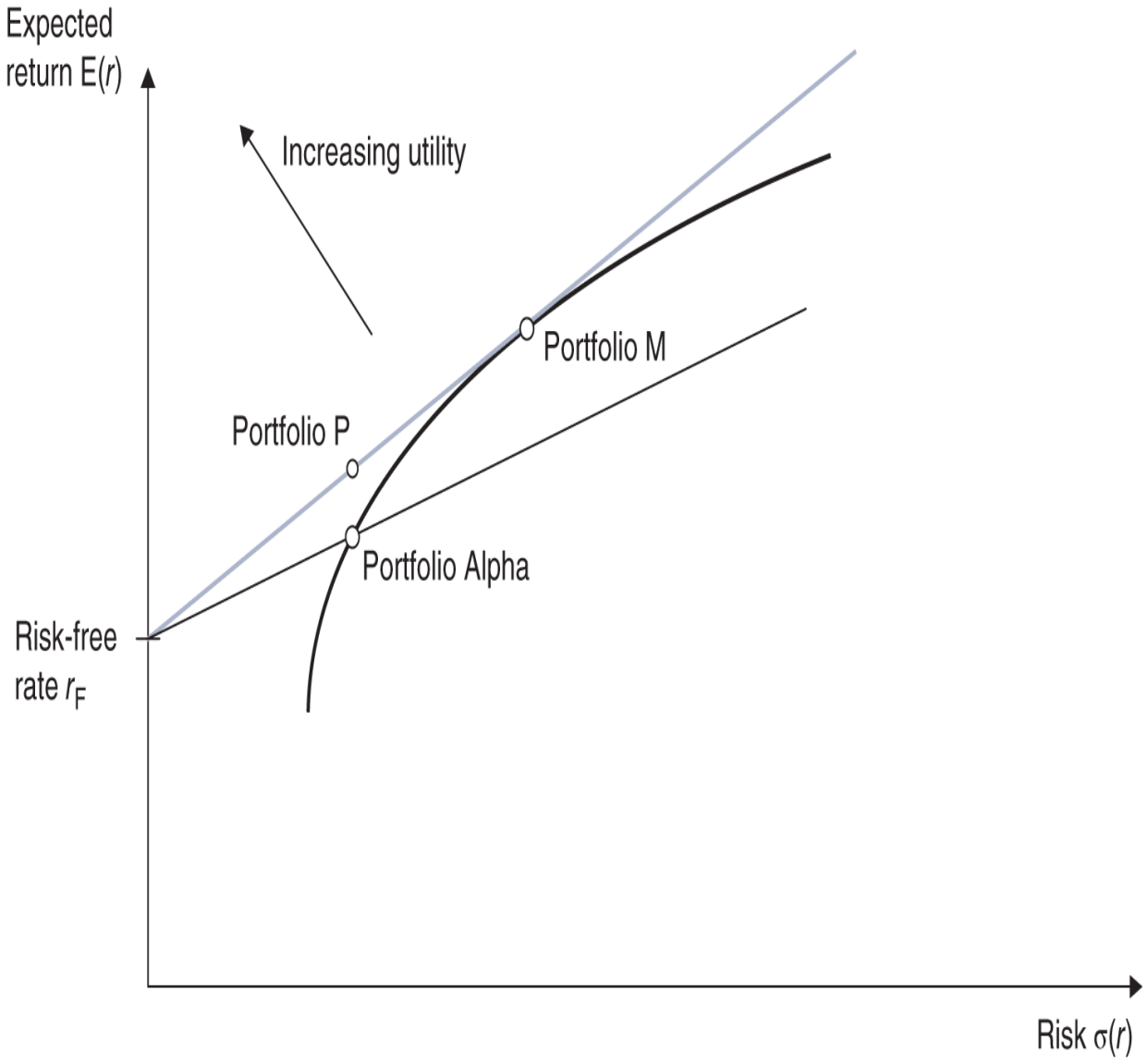
Hence:

$$E(r_{H,F}) = 3\% + (5\%/10\%) \times (6\% - 3\%) = 4.5\%$$

For a portfolio that includes a risk-free asset, there is a linear relationship between expected return and risk. To lower a portfolio's risk, simply liquidate some of the portfolio's stock and put the proceeds into a risk-free asset. To increase risk, it is only necessary to borrow at the risk-free rate and invest in a stock with risk.

2/ RISK-FREE ASSETS AND THE EFFICIENT FRONTIER

The risk–return profile can be chosen by combining risk-free assets and a stock portfolio (the alpha portfolio on the chart below). This new portfolio will be on a line that connects the risk-free rate to the portfolio alpha that has been chosen. But as we can observe on the chart, this portfolio is not the best portfolio. Portfolio P provides a better return for the same risk. Portfolio P is situated on the line tangential to the efficient frontier. There is no other portfolio than P that offers a better return for the same amount of risk-taking. What is portfolio P made up of? It's made up of a combination of the portfolio of risky assets M (located on the efficient frontier at the tangential point with the line originating from the risk-free rate) and the risk-free asset.



Investors' taste for risk can vary, yet the above graph demonstrates that the shrewd investor should be investing in portfolio M. It is then a matter of adjusting the risk exposure by adding or subtracting risk-free assets.

If all investors acquire the same portfolio, then this portfolio must contain all existing shares. To understand why, suppose that stock *i* was not in portfolio M. In that case, nobody would want to buy it, since all investors hold portfolio M. Consequently, there would be no market for it and it would cease to exist.

The “market portfolio” includes all stocks at their market value. The market portfolio is thus weighted proportionally to the market capitalisation of a particular market.

The weighting of stock *i* in a market portfolio will necessarily be the value of the single security divided by the sum of all the assets. As we are assuming fair value, this will be the fair value of *i*.

3/ CAPITAL MARKET LINE

The expected return of a portfolio consisting of the market portfolio and the risk-free asset can be expressed by the following equation:

$$E(r_P) = r_F + \frac{\sigma_P}{\sigma_M} \times \left[E\left(r_M\right) - r_F\right]$$

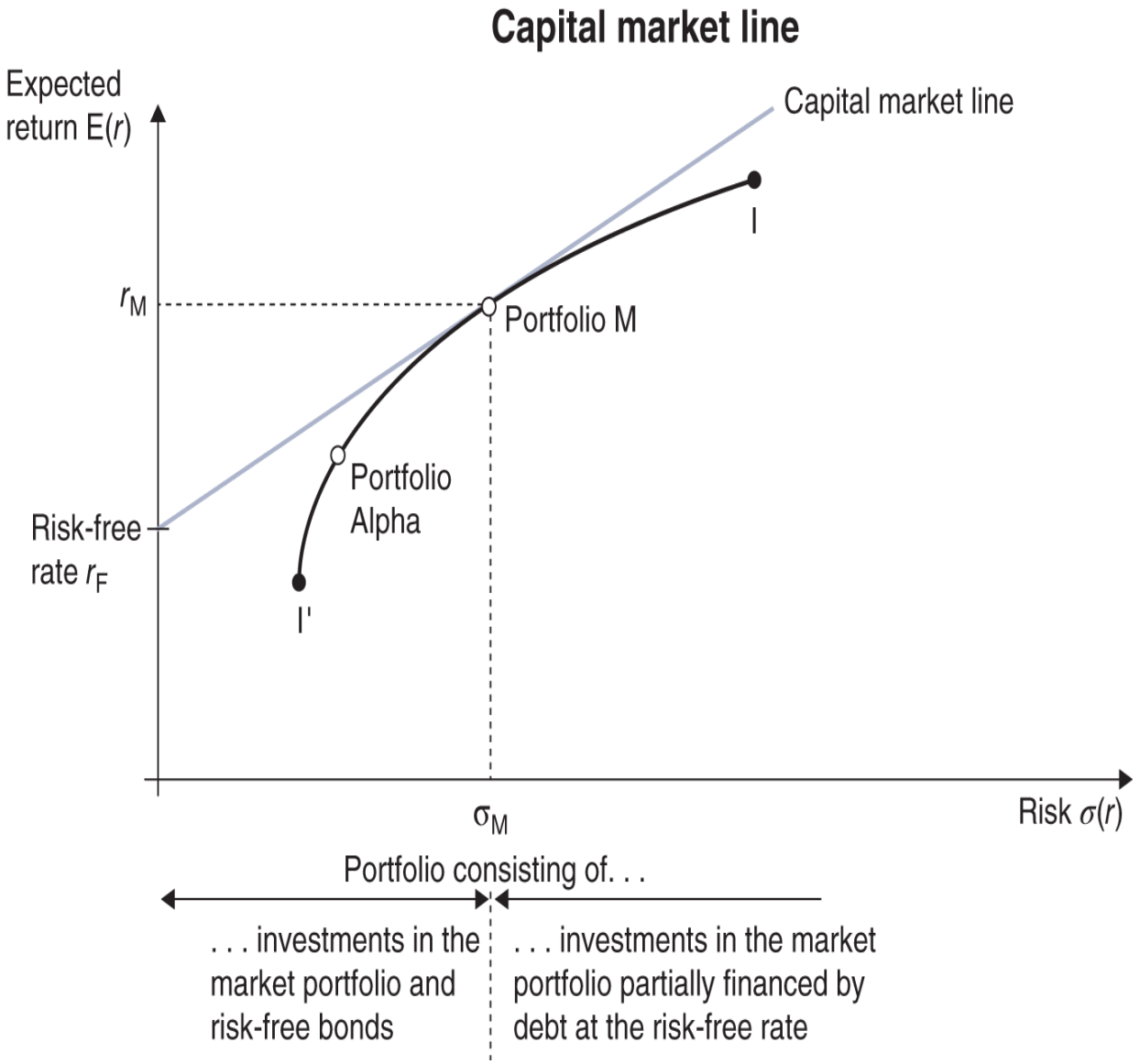
where $E(r_P)$ is the portfolio's expected return, r_F the risk-free rate, $E(r_M)$ the return on the market portfolio, σ_P the portfolio's risk and σ_M the risk of the market portfolio.

This is the equation of the **capital market line**.

The most efficient portfolios in terms of return and risk will always be on the capital market line. The tangent point at M constitutes the optimal combination for *all* investors. If we introduce the assumption that all investors have **homogeneous expectations**, i.e. that they have the same opinions on expected returns and risk of financial assets, then the efficient frontier of risky assets will be the same for all of them. The capital market line is the same for all investors and thus each of them would hold a combination of the portfolio M and the risk-free asset.

It is reasonable to say that the portfolio M includes all the assets weighted for their market capitalisation. This is defined as the **market portfolio**. The market portfolio is the portfolio that all investors hold a fraction of, proportional to the market's capitalisation.

> The capital market line links the market portfolio M to the risk-free asset. For a given level of risk, no portfolio is better than those located on this line.
>
> A rational investor will not take a position on individual stocks in the hope of obtaining a big return, but rather on the market as a whole. They will then choose their risk level by adjusting their debt level or by investing in risk-free assets. This is the separation theorem.

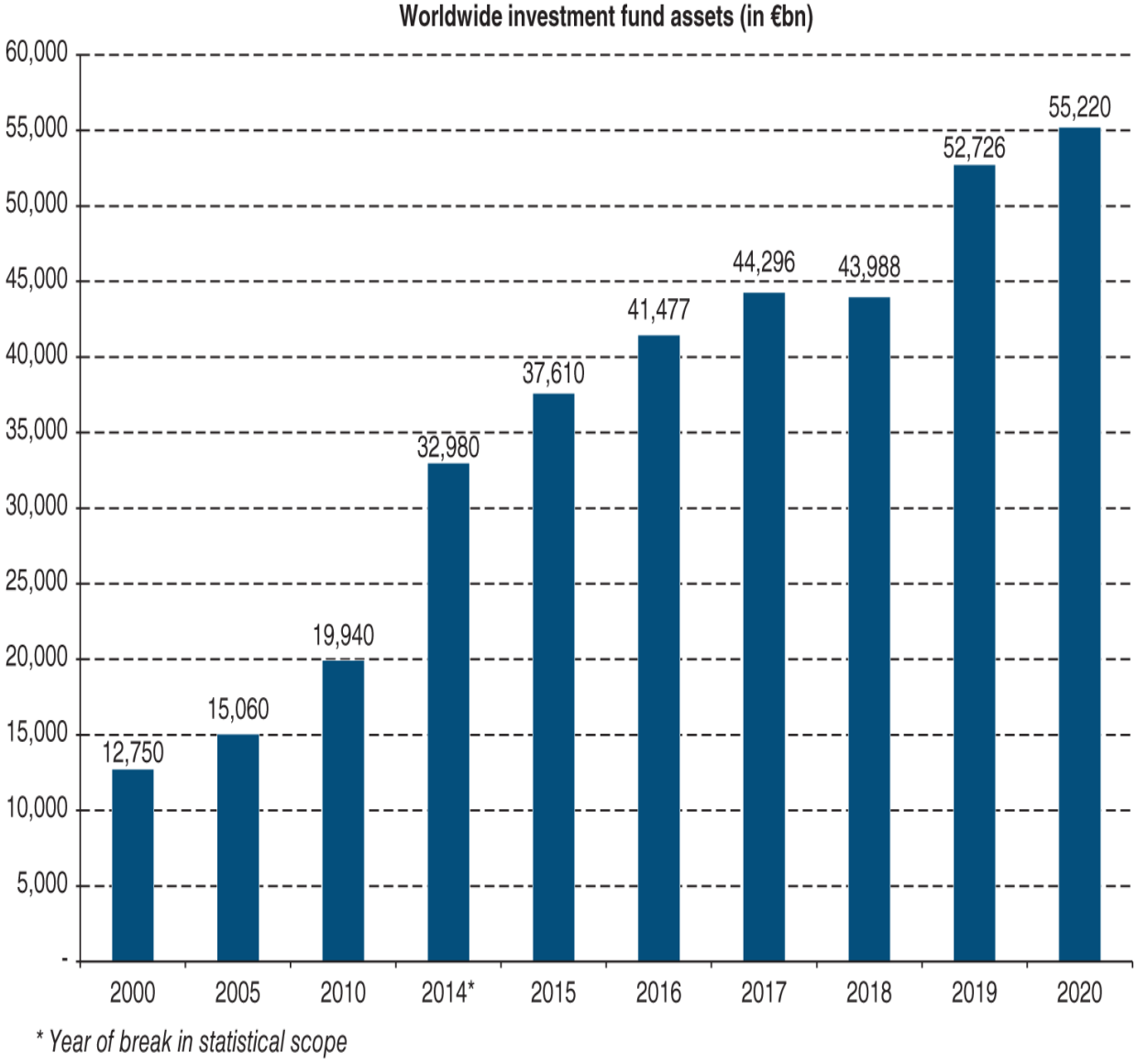


Only portfolios located on a line passing through M and on a tangent to the efficient frontier are optimal. The others, such as portfolio alpha, are suboptimal.

Section 18.9 HOW PORTFOLIO MANAGEMENT WORKS

The financial theory described so far seems to give a clear suggestion: in efficient markets, invest only in highly diversified mutual funds and in government bonds.

The asset management industry is one of the most important industries in the modern economy, managing €55,000bn worldwide (40% of this amount being invested in shares and 22% in bonds, the rest in short-term debts and multi-assets). Managers are employees of banks, insurance companies or independent.



** Year of break in statistical scope*

Source: Data from Efama

However, as our readers know, not all investors subscribe to this theory. Some take other approaches, described below. Sometimes investors combine different approaches.

The strategy that is closest to financial theory is index tracking, also known as passive management. It consists of trying to follow the performance of a market index. **Index trackers** are ideal tools for the investor who believes strongly in market efficiency. They also benefit from scale effect and therefore have reduced operating costs. Index trackers can be listed on a market and are then called exchange-traded funds (ETFs). Most stock markets now have a specific market segment for the listing of trackers. Across global markets, over 7,845 trackers are listed for a total amount of over $8,331bn.

In terms of portfolio management, we shall consider the difference between a **top-down** and a **bottom-up** approach. In a top-down approach, investors focus on the asset class (shares, bonds, money-market funds) and the international markets in which they wish to invest (i.e. the individual securities chosen are of little importance). In a bottom-up approach (commonly known as stock-picking), investors choose stocks on the basis of their specific characteristics, not the sector in which they belong. The goal of the bottom-up approach is to find that rare pearl, i.e. the stock that is undervalued by the market, which is identified through fundamental analysis, a method of seeking the intrinsic value of a stock. Investors following this approach believe that sooner or later, market value will approach intrinsic value.

These stocks can be growth stocks, i.e. companies who are operating in a fast-growing industry; or value stocks, i.e. firms operating in more mature sectors but which offer long-term performance. At the opposite end you will find yield stocks whose return comes almost exclusively from the dividend paid, and their market price is then pretty stable.

Investors who focus on technical analysis, the so-called chartists, do not seek to determine the value of a stock. Instead, these investors conduct detailed studies of trends in a stock's market value and transaction volumes in the hope of spotting short-term trends.

Another type of fund management has arisen since the mid-1990s, so-called **alternative management**, which gives itself total freedom of investment tools, whether listed or not: equities, bonds, currencies, commodities, etc., and of investment styles: buying, short selling, derivatives (see Chapter 23), heavy reliance on debt, and shareholder activism. Its objective is not to duplicate the performance of any index, but to obtain positive returns regardless of the state of the market and thus to offer additional diversification. An example of alternative management is the **hedge fund**, which is a speculative fund seeking high returns and relying heavily on derivatives, and options in particular. Hedge funds use leverage and commit capital in excess of their equity.

At the beginning of 2021, over 7,000 hedge funds were active in the world and had about $3,800bn under management.

In recent years, hedge funds' risk-adjusted performance has been above that of traditional management, this even in bearish markets, with a relatively low correlation with other investment opportunities.

Hedge funds may present some restrictions on investing (minimum size). **Funds of funds** allow a larger number of investors to invest in hedge funds. The funds of funds pick up the best hedge fund managers and package their products to be offered to a wide number of investors.

Last but not least are private equity funds, which invest mainly in non-listed firms at different stages of maturity, via LBOs or otherwise (see Chapter 47). Their growing scope of investments is slowly turning them into an alternative to stock markets.

Regardless of the investment strategies and tools used, asset management is currently witnessing a rise in responsible investment, which applies environmental, social and governance (ESG, see Chapter 1) criteria to investment choices. Worldwide, approximately a third of assets under management are managed according to ESG criteria. This figure reaches 49% in Europe. Under the influence of the ultimate beneficiaries of these funds, and the conviction of a certain number of managers, responsible investment is becoming the norm, especially since in some countries regulations require managers to explicitly detail their policies with regards to ESG criteria.

Within this category, SRI (socially responsible investment, see Chapter 1) strategies focus on selecting the most advanced companies in terms of sustainable development.

SUMMARY

The summary of this chapter can be downloaded from www.vernimmen.com.

There are various risks involved in financial securities. There are economic risks (political, inflation, etc.), which threaten cash flows from financial securities and which come from the "real economy", and there are financial risks (liquidity, currency, interest rate and other risks), which do not directly affect cash flow and come under the financial sphere.

All risks, regardless of their nature, lead to fluctuations in the value of a financial security.

In a market economy, a security's risk is measured in terms of the volatility of its price (or of its rate of return). The greater the volatility, the greater the risk, and vice versa.

We can break down the total risk of a financial security into a market-related risk (market or systematic risk) and a specific risk that is independent of the market (intrinsic or diversifiable risk). These two risks are totally independent.

The market risk of a security is dependent on its β coefficient, which measures the correlation between the return on the security and the market return. Mathematically, this is the regression line of the security's return versus that of the market.

The β coefficient depends on:

the sensitivity of the company's business sector to the wider market;

the economic situation;

the company's operating cost structure (the higher the fixed costs, the higher the β);

the financial structure (the greater the group's debts, the higher the β);

the quality and quantity of information provided to the market (the greater visibility there is over future results, the lower the β); and

earnings growth rates (the higher the growth rate, the higher the β).

Although the return on a portfolio of shares is equal to the average return on the shares within the portfolio, the risk of a portfolio is lower than the average risk of the shares making up that portfolio. This happens because returns on shares do not all vary to exactly the same degree, since correlation coefficients are rarely equal to 1.

As a result, some portfolios will deliver better returns than others. Those portfolios that are located on the portion of the curve known as the efficient frontier will deliver better returns than those portfolios that are not. However, given portfolios located on the efficient frontier curve, it is impossible at this stage to choose an optimal portfolio objectively from among them. The choice then becomes an individual one, and every investor chooses the portfolio according to their personal appetite for (or aversion to) risk.

By including risk-free assets, i.e. assets on which the return is guaranteed – such as government bonds, it is possible to obtain portfolios that are even more efficient.

The inclusion of a risk-free asset in a portfolio leads to the creation of a new efficient frontier, which is the line linking the risk-free asset to the market portfolio in the risk/returns space. This new line is called the capital market line. Investors are well advised to own shares in this market portfolio and to choose the level of risk that suits them by investing in risk-free assets or by going into debt. On this line, no portfolio could perform better, i.e. no portfolio could offer a better return for a given level of risk, or a lower risk for a given return.

Portfolio theory is generally applied in varying degrees, as demonstrated by the existence of investment strategies that favour certain securities rather than market portfolios.

QUESTIONS

1/How is risk measured in a market economy?

2/What does the β coefficient measure?

3/In the first graph of Section 18.2, which is the most volatile asset? What motivates investors to enter this market?

4/The β coefficient measures the specific risk of a security. True or false?

5/Is the Danone share more or less risky than the whole of the market? Why?

6/Upon what is the β coefficient dependent?

7/Why are market risk and specific risk totally independent?

8/Will an increase in a company's debt reduce or increase the volatility of its share price?

9/As a result of a change in the nature of its business, there is a relative rise in the proportion of fixed costs in a group's total costs. Will this affect the risk attached to its share price? If so, how?

10/Explain why it is unhealthy for a company to invest its cash in shares.

11/Is the β of a diversified conglomerate close to 1? Why?

12/Internet companies have low fixed costs and low debt levels, yet their β coefficients are high. Why?

13/Is the β coefficient of a group necessarily stable over time? Why?

14/You buy a lottery ticket for €100 on which you could win €1,000,000, with a probability rate of 0.008%. Is this a risky investment? What is the β coefficient of this investment? Could it be even riskier? How could you reduce the risk? Would this be a good investment?

15/Why is standard deviation preferable to variance?

16/What law of statistics explains that in the long term, risk disappears? State your views.

17/You receive €100,000 which you decide to save for your old age. You are now 20. What sort of investment should you go for? Perform the same analysis as if it happened when you were 55 and 80.

18/Do shares in biotech companies carry a greater or smaller risk than shares in food groups? Why?

19/There are some sceptics who claim that financial analysis serves no purpose. Why? State your views.

20/Why are negative β coefficients unusual?

21/What can you say about a share for which the standard deviation of the return is high, and the β is low?

22/Must the values of financial assets fluctuate in opposite directions in order to reduce risk? Why?

23/What other concept does the capital market line bring to mind?

24/Why does the market portfolio include all risky assets?

25/Security A carries little risk and security B has great risk. Which would you choose if you wanted to take the least risk possible?

26/Use the table in Section 18.6 to determine which industrial sector makes the greatest contribution to reducing the risk of a portfolio.

27/What is the only asset that can be used to precisely measure the levels of risk of a portfolio?

28/What conditions are necessary for a risk-free asset to be free of risk? Provide an example. Is it really risk-free?

29/Show that the market portfolio must be on the capital market line and on the portion of the curve called the efficient frontier (see Section 18.7).

30/Why does this chapter provide an explanation of the development of mutual funds?

31/Can the risk of a portfolio be greater than the individual risk of each of the securities it contains? Under what circumstances?

32/Under what circumstances can the risk of a portfolio be less than the individual risk of each of the securities it contains?

33/The greater the number of shares in a portfolio, the less the marginal contribution to diversification of an additional security will be. True or false?

34/Will very wide diversification eliminate specific risk? And market risk?

35/What do you think of this observation: over 10 years, only 10% of asset managers have outperformed passive managers in the large company equity segment, while more than 50% have outperformed passive managers in the small and medium company equity segment.

You'll find more questions at www.vernimmen.com.

EXERCISES

1/Calculate the return on the LVMH share and on the French index over 12 months until March 2019. To help you, you have a record of the share price and of the general index (CAC40). What is the total risk of the LVMH share? What is the β coefficient of LVMH? What portion of the total risk of the LVMH share is explained by market risk?

Period	Mar 18	Apr 18	May 18	Jun 18	Jul 18	Aug 18	Sep 18	Oct 18	Nov 18	Dec 18	Jan 18	Feb 19	Mar 19
LVMH	244.9	281.5	293.5	304.1	296.4	300.3	292.5	262.9	270.6	250	253.9	289.6	302
CAC40	5,252	5,322	5,529	5,543	5,429	5,415	5,345	5,095	5,097	4,840	4,800	5,062	5,234

2/A portfolio gives a 10% return with a standard deviation of 18%. You would like the standard deviation to drop to 14%. What should you do? What should you do if you want the standard deviation to rise to 23%?

3/Calculate the risk and returns of portfolio Z in Section 18.7. What is the proportion of Heineken shares and Criteo shares in this portfolio?

4/A portfolio gives a 10% return for a standard deviation of 18%. The shares in companies C and D have the following returns and standard deviations:

	C	D
Expected return (%)	10	20
Standard deviation (%)	15	30

The correlation between the return on these two shares is 25%.

Calculate the expected return and the standard deviation for each of the following portfolios:

P_1: 100% C; P_2: 75% C + 25% D; P_3: 50% C + 50% D;

P_4: 25% C + 75% D; P_5: 100% D.

Plot your results on a graph. What are your conclusions?

ANSWERS

Questions

1/*The volatility of the value of the asset is measured by the standard deviation of its rate of return.*

2/*The correlation between the return on the security and the market return, the market risk of the security, the line of the regression of the security's return vs. that of the market, the relative volatility of the stock compared to the market.*

3/*The Chinese shares carry the most risk, but they will also bring the highest returns.*

4/*False, it measures the market risk of a security.*

5/*It is difficult to give a very accurate answer, without knowing what the share's specific risk is. If you ignore it, it is less risky as it fluctuates less widely than the market index (due to the low volatility of its industry).*

6/*On the company's operating cost structure, its financial structure, its information policy and the growth rate of its earnings.*

7/*One has an impact on all securities, the other on a given security.*

8/*It will increase volatility due to the leverage effect, see Chapter 13.*

9/*Yes, it will increase volatility due to the effect of the breakeven point, see Chapter 10.*

10/*Because cash, by definition, should be available at all times, and share prices are very volatile.*

11/*Usually yes, because conglomerates are highly diversified and are a bit like "mini markets" in their own right.*

12/*Because of the very poor visibility we currently have over what is going to happen to Internet stocks.*

13/*No, as the group's business and financial structure can change over the course of time, which will have a knock-on effect on the β.*

14/*Yes, very risky, because you have a 99.992% chance of losing your €100. 0, because the result of the lottery is random, without any connection to the economy or the market. Yes it could, if you used debt to finance the €100. If you bought all of the lottery tickets you would be sure of winning the €1,000,000, but that would cost you €100/0.008% = €1,250,000, which wouldn't be exactly a very good investment.*

15/*Because the degree of variance is two, contrary to return and standard deviation, which share the same degree (one).*

16/*The law of large numbers. The risk is never completely eliminated and one needs to be able to hold on to the assets for a long period of time.*

17/*Equities, bonds, money-market investments.*

18/*A greater risk as the outlook is very uncertain, whereas the visibility over the earnings of large retail groups is very good.*

19/*Financial analysis contributes very little, as it must be acted upon immediately and the results seen in the share price – financial analysis kills financial analysis. Financial analysis is necessary for market equilibrium (rationality).*

20/*Because if they weren't, when markets went up, the price of most securities making up these markets would fall, which would be absurd.*

21/*That it carries a specific risk which is very high.*

22/*Of course not. The correlation must just not be equal to 1.*

23/*The leverage effect.*

24/*By definition.*

25/*A combination of A and B, and not only security A, at least if $r \neq 1$.*

26/*The energy sector, because correlation coefficients with the other sectors are lower.*

27/*A risk-free asset. The larger its weighting in the portfolio, the smaller the portfolio's risk will be.*

28/*There must be no doubts about the solvency of the issuer, no risk vis-à-vis the rate at which the coupons can be reinvested, and protection against inflation. A zero-coupon government bond indexed to inflation. No, because there will always be a risk that the price will fluctuate before maturity.*

29/*By construction, on the capital market line because this line is constructed from two points – itself and the risk-free asset. It is on the efficient frontier in Section 18.7 because, given its high level of diversity, risk is reduced to a minimum.*

30/*Because a mutual fund is a reduced model of the market portfolio, which would be difficult to compile at an individual level.*

31/*Yes, it is financed by debt.*

32/*If it includes a large percentage of risk-free assets.*

33/*True, because the portfolio is already very diversified.*

34/*Yes, by definition. No, this would be impossible.*

35/*The market is much more efficient for large companies than it is for small listed companies, where an in-depth analysis can allow to find undervalued companies.*

Exercises

A detailed Excel version of the solutions is available at www.vernimmen.com.

1/*Returns on the LVMH share: 23.3%; LVMH risk σ = 7.44%.*

Returns on the French index: –0.3%%; index risk σ = 3.19%; LVMH β = 1.97; share of risk explained by market risk = 84.6%.

2/*Add more risk-free assets until they account for 4/18 of the portfolio. Use debt to finance an increase in the size of this portfolio by 5/18.*

3/*83% of Heineken shares and 17% of Criteo shares. E(r) = 7.19% and σ = 9.57%.*

4/

	Expected return (%)	Standard deviation (%)
P_1	10.00	15.00
P_2	12.50	15.00
P_3	15.00	18.37
P_4	17.50	23.72
P_5	20.00	30.00

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NOTE

1 *At least in the models applied by a vast majority of market players*.

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Chapter 19
THE REQUIRED RATE OF RETURN

A ship in a harbour is safe but that is not what ships are built for

The previous chapter described the important concepts of risk, return and the market portfolio. It also highlighted the notion of risk premium (i.e. the difference between the return on the portfolio and the risk-free rate); this chapter continues to explore the risk premium in greater depth.

> In a fairly valued market, the question arises: what risk premium must be added to the risk-free rate to determine the required rate of return?

Investors must look at the big picture, first by investing in the market portfolio, then by borrowing or by investing in risk-free instruments commensurate with the level of risk they wish to assume. This approach allows them to assess an investment by merely determining the additional return and risk it adds to the market portfolio.

> Investment risk is often broken down into its component parts, not necessarily in economic and financial terms, but rather into the volatility of the security itself and the volatility of the market as a whole.

We now want to know how to get from r (the discounting rate used in calculating company value) to k (the return required by investors on a specific security).

Remember that this approach applies only if the investor owns a perfectly diversified portfolio.

Here is why: the greater the risk assumed by the financial investor, the higher their required rate of return. However, if they make just one

investment and that turns out to be a failure, their required rate of return will matter little, as they will have lost everything.

With this in mind, it is easier to understand that the risk premium is relevant only if the financial investor manages not just a single investment, but a diversified portfolio of investments. In this case, the failure of one investment should be offset by the return achieved by other investments, which should thereby produce a suitable return for the portfolio as a whole.

> The concept of risk premium only makes sense when risk is spread over many investments. The ideas of portfolio management and of diversification are at the heart of finance. They are key to understanding how a commercial bank or an insurance company works.

This is the main difference between an industrial investment and a financial investment.

An entrepreneur who sets up their own company does not act like a financial investor, as they own just one investment. As their assets are not diversified, it is a matter of “life or death” for the firm that the investment succeeds. The law of averages in risk diversification does not apply to them.[1]

The financial investor, on the other hand, needs portfolio management tools to estimate the risk–return on each of their investments. Portfolio theory is not the main objective here, but it is useful to introduce some basic notions with which financial managers must be familiar.

Section 19.1 RETURN REQUIRED BY INVESTORS: THE CAPM

The CAPM (capital asset pricing model) was developed in the late 1950s and 1960s. Based on the work of Harry Markowitz, William Sharpe, John Lintner and Jack Treynor, it is now universally applied.

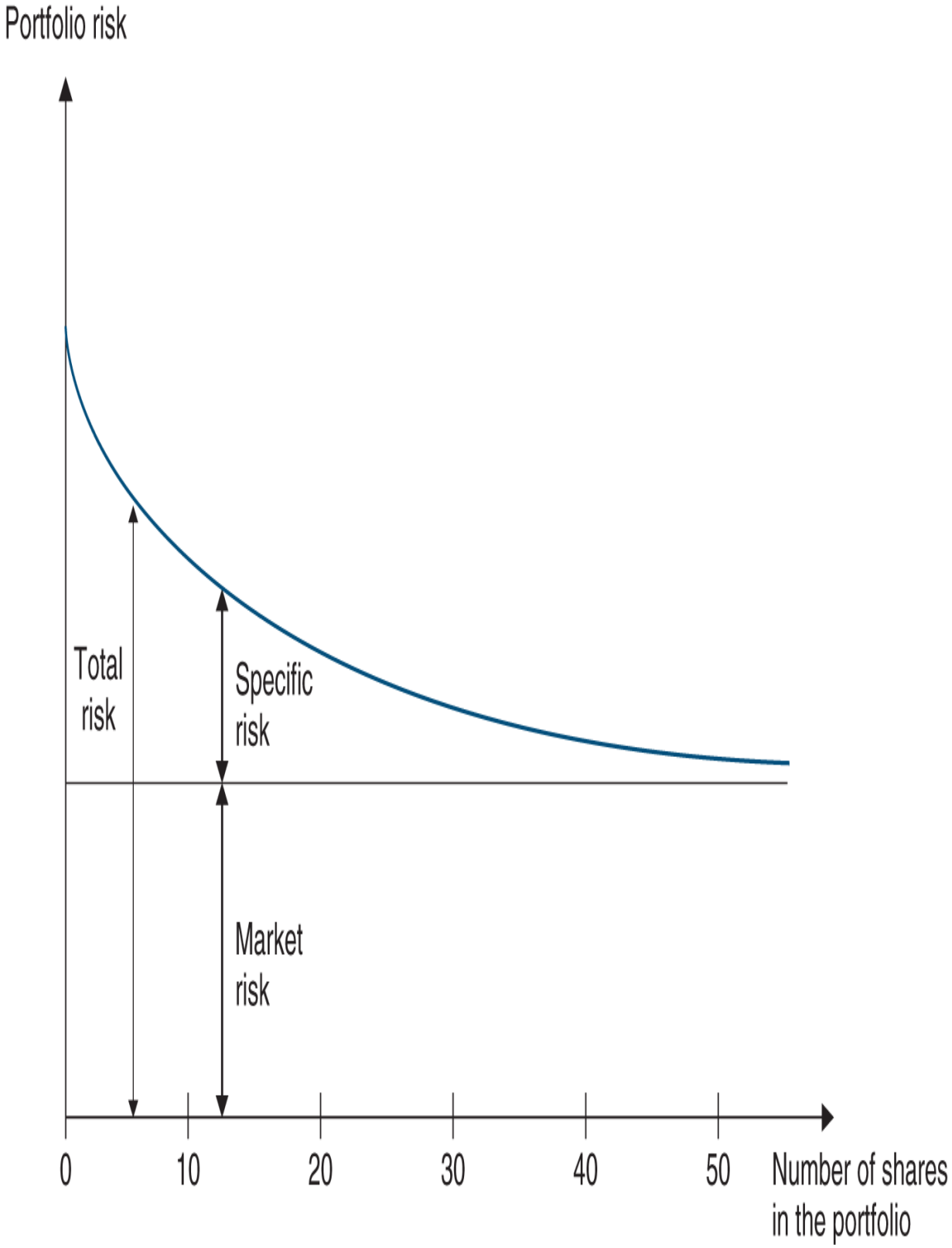
The CAPM is based on the assumption that investors act rationally and have at their disposal all relevant information on financial securities (see “efficient markets” in Chapter 15). Like the investor in Chapter 18, they seek to maximise their return, at a given level of risk.

The capital market line that we described in the previous chapter set the relationship for the return of a portfolio. CAPM aims at defining the same relationship but for a specific security (and not for a portfolio) in order to determine the return required for this security depending on its risk.

Remember that in order to minimise total risk, investors seek to reduce that component which can be reduced, i.e. the specific risk. They do so by diversifying their portfolios.

It can be observed that diversification reduces specific risk fairly quickly.

The effect of diversification



As a result, when stocks are fairly valued, investors will receive a return only on the portion of risk that they cannot eliminate – the market risk, or the non-diversifiable risk. Indeed, in a market in which arbitrage is theoretically possible, they will not be amply remunerated for a risk that they could otherwise eliminate themselves by simply diversifying their portfolios.

> Portfolio theory's essential contribution is to show that an investor's required rate of return is not linked to total risk, but solely to market risk. Conversely, in a fairly valued market, intrinsic or diversifiable, risk is not remunerated.

This means that the required rate of return (k) is equal to the risk-free rate r_F,[2] plus the risk premium for the non-diversifiable risk, i.e. the market risk.

This can be expressed as follows:

$$\text{Required rate of return} = \text{risk-free rate} + \beta \times \text{market risk premium},$$

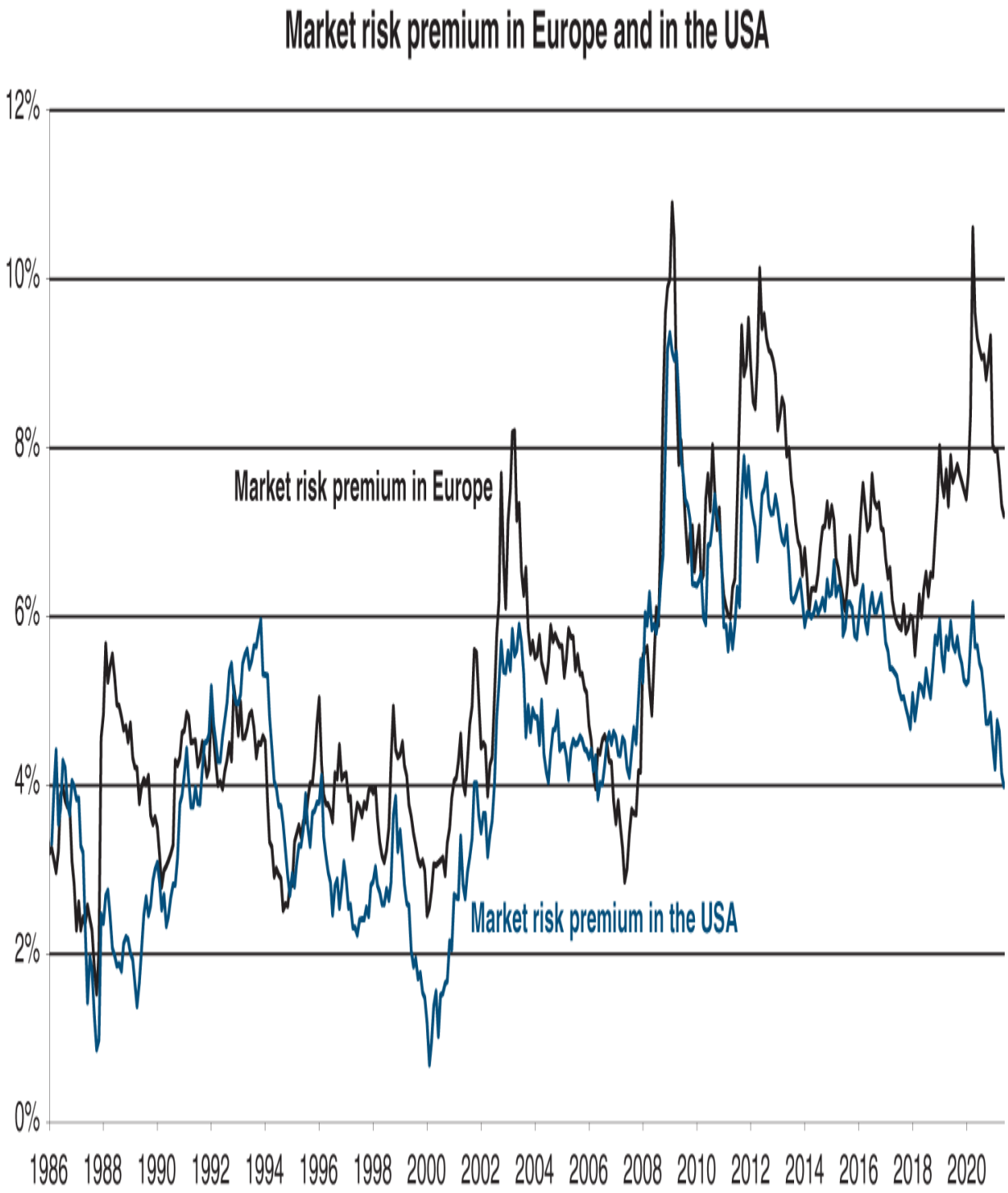
or:

$$k = r_F + \beta \times (k_M - r_F)$$

where k_M is the required rate of return for the market and β the sensitivity coefficient described previously.

Note that the coefficient β measures the non-diversifiable risk of an asset and not its total risk. So it is possible to have a stock that is, on the whole, highly risky but with a low β if it is only loosely correlated with the market.

The difference between the return expected on the market as a whole and the risk-free rate is called the **equity risk premium**.



Source: Data from Associés en Finance (Europe), BNP Paribas Arbitrage & Damodaran (USA)

Over the very long term (120 years!), the historical risk premium has been as follows:

Belgium	3.0%	South Africa	6.0%

China (1993–2020)	4.6%	Spain	3.3%
France	5.5%	Switzerland	3.9%
Germany (exc. 1922/23)	6.2%	US	5.8%
Italy	5.6%	UK	4.3%
India	6.1%	Europe	3.5%
Japan	6.1%	World	4.4%
Russia (1995–2020)	7.4%		

Source: Crédit Suisse Global Investment Returns Yearbook, 2021. Equity risk premium compared to short-term interest rates.

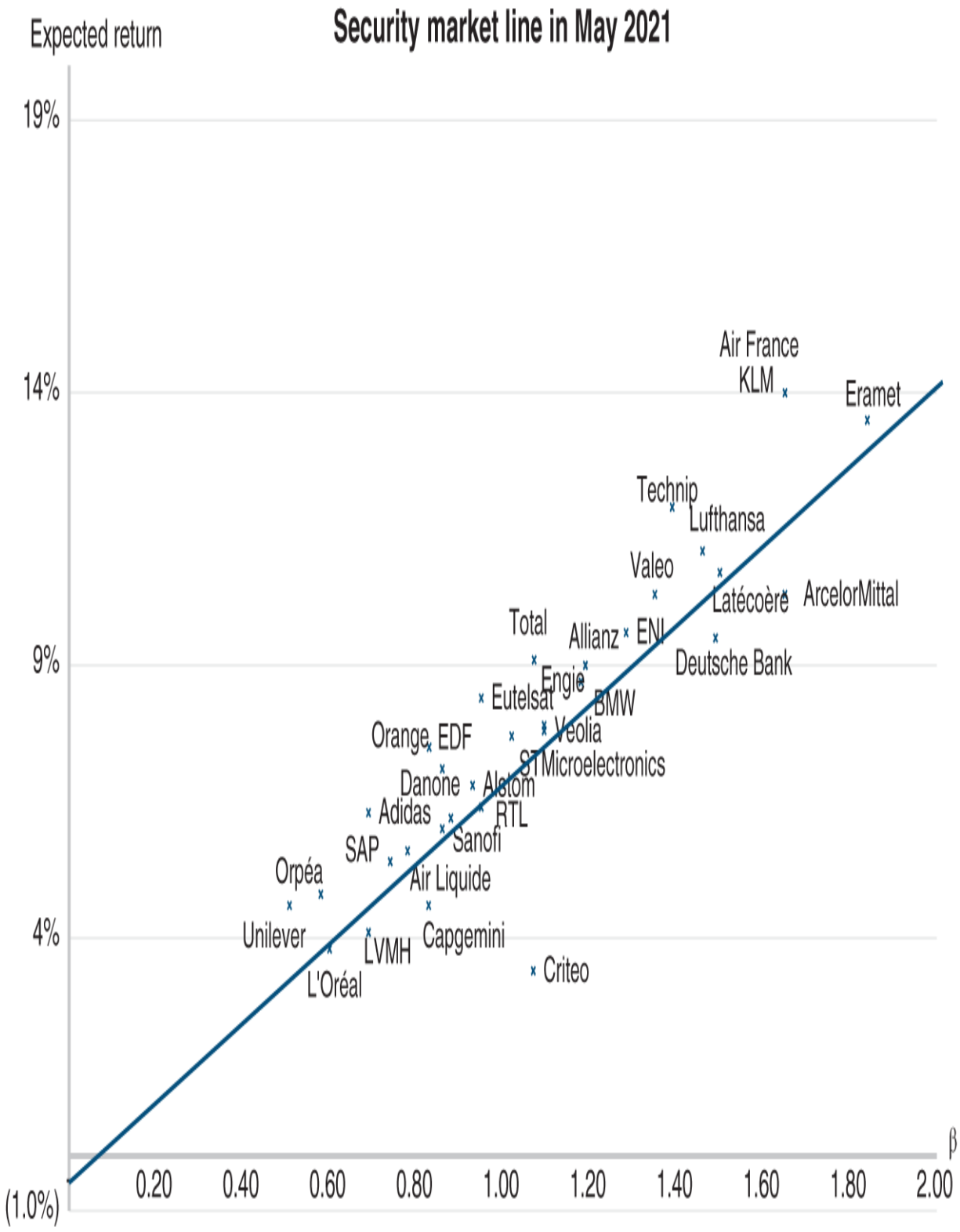
The equity risk premium can be historical or expected (or anticipated). The historical risk premium is equal to the annual performance of equity markets (including dividends) minus the risk-free rate. The expected risk premium is not directly observable. However, it can be calculated by estimating the future cash flows of all the companies, and then finding the discount rate that equates those cash flows with current share prices, from which we deduct the risk-free interest rate. This expected risk premium is the one used in the CAPM.

To determine the risk premium for each stock, simply multiply the market risk premium by the stock's beta coefficient.

Hence, if the risk-free rate is –0.5% and the expected risk premium is 8.0%, a shareholder in the French car subcontractor Valeo will expect a return of –0.5% + 1.56 × 8.00% = 12.0%, if Valeo's β is 1.56, while a shareholder in L'Oreal will expect –0.5% + 0.70 × 8.0% = 5.1%, as L'Oreal's β is 0.70.

Section 19.2 THE SECURITY MARKET LINE

The research house Associés en Finance publishes the securities market line[3] for the entire eurozone. It is calculated on the basis of the **expected return** on the *y*-axis and the **beta coefficient of each stock** on the *x*-axis.



Source: Data from Associés en Finance, 2021

The securities market line is quite instructive. It helps determine the required rate of return on a security on the basis of the only risk that is remunerated, i.e. the market risk.

Shifts in the securities market line itself characterise the nature of changes in the markets and make it easier to understand them:

a parallel shift, with no variation in slope (which represents the equity risk premium), reflects a change in interest rates. For example, a cut in interest rates normally leads to a downward shift and thus a general appreciation of all stocks;

a non-parallel shift (or pivoting) reflects a change in the risk premium and thus in the remuneration of risk. In this case, the riskiest stocks will move the most, whereas the least risky stocks may not be significantly affected.

In addition, the position of points vis-à-vis the market line serves as a decision-making tool. The above chart tells us that Orange offers too high an expected return for its risk. Investors will realise this and buy it, thus raising its price and lowering expected return. A stock that is “above” the securities market line is thus undervalued, while a stock that is “below” the securities market line (like Adidas) is overvalued.

But do not rush to place an order. Since this chart was printed, prices have had plenty of time to adjust.

Section 19.3 LIMITS OF THE CAPM

The CAPM assumes that markets are efficient and it is without a doubt the most widely used model in modern finance. But if we wanted to be facetious, we would say that each element of the CAPM poses a practical problem!

1/ THE LIMITS OF DIVERSIFICATION

The CAPM is a development of portfolio theory and is based on the assumption that diversification helps to reduce risk reducing it to the non-diversifiable risk. A study by Campbell *et al*. (2001) shows that diversification is increasingly complex and that nowadays a portfolio of at least 50 stocks is required to reduce risk significantly.

This is due, among other things, to the greater volatility of individual stocks, although markets as a whole are no more volatile. Other reasons for this phenomenon are the arrival on the market of riskier companies, such as biotech, Internet and younger companies, and the near extinction of conglomerates, which, by nature, provided some diversification in and of themselves.

Meanwhile, the correlation between market return and return on individual stocks is falling. This may undermine the relevancy of the CAPM. Statistically, beta is becoming less and less relevant.

2/ DIFFICULTIES IN PRACTICAL APPLICATION OF THE CAPM

The first difficulty one encounters when using the CAPM is determining the risk-free rate which, all things considered, is just a theoretical concept.

Practitioners usually use as a risk-free rate the yield of long-term government bonds. They put forward the similar weighted average duration of the cash flows of the assets to be valued and of long-term bonds. The issue is that long-term government bonds are not without risk: their value can fluctuate in time depending on changes in interest rates (which is inevitable given the long period of time since their issue). Even investors that plan to keep government bonds until their maturity suffer from these interest rate fluctuations for the reinvestment of coupons. In addition,

unanticipated changes in inflation can impact what could have appeared as a risk-free investment. Finally, there remains the solvency risk of the issuer. The increasing levels of debt of most Western countries mean that this risk is not just theoretical, as demonstrated in recent years in Greece.

Therefore, it appears more rational to use as a risk-free rate the short-term interest rate. Short-term bills are virtually not impacted by changes in interest, coupon reinvestment risk does not exist and bankruptcy risk is minor. For the Eurozone, the risk-free rate could be assessed on the basis of the return on short-term German Treasury bills.

The three key global providers of equity market risk premium data (Ibbotson, Dimson-Marsh-Staunton and Associés en Finance) propose a computation of the market risk premium based on long-term interest rates or short-term interest rates. The most important factor is not to add a short-term interest rate to a market premium computed on the basis of long-term rates, or the reverse.

Roll (1997) has pointed out that determining a market portfolio is not as easy as one would like to think. In theory, the market portfolio is not solely made up of stocks or even just financial assets, but of all the assets that can be acquired. It is therefore impossible, in practice, to come up with a true market portfolio, especially when looking at it from an international point of view.

However, we still have to determine the return expected from the market portfolio. As the CAPM is used for making forecasts, it can also be used to calculate the return expected from a security based upon the return expected from the market portfolio, as well as the security's anticipated risk (its β). However, “anticipated” data cannot be observed directly in the market, and so forecasts must be made on the basis of historical data and macroeconomic data. For some countries, such as emerging nations, this is not easy!

3/ THE INSTABILITY OF β

The main criticism of beta is its instability over time. It boils down a large amount of information into a single figure, and this strength becomes its weakness.

The CAPM is used to make forecasts. It can be used to calculate expected return on the basis of anticipated risk. Therefore, it would be better to use a forecast β rather than a historical value, especially when the coefficient is not stable over time.

For this reason, calculations must often be adjusted to reflect the regularity of earnings and dividends, and visibility on the sector. Blume *et al*. (1975) have sought to demonstrate a convergence of β towards 1. This seems counterintuitive to us as some sectors will always have a beta greater than 1. In addition, the recent crisis has demonstrated that, in difficult times, the gap between high β and low β increases.

4/ THE THEORETICAL LIMITS OF CAPM AND MARKETS AT FAIR VALUE

The CAPM assumes markets are fairly valued. But markets are not necessarily always at fair value. The fact that technical analysis has become so prominent on trading floors shows that market operators themselves have doubts about market efficiency (see Chapter 18).

Moreover, the theory of efficient markets in general, and the CAPM in particular, is based on the premise that market operators have rational expectations. To be applicable, the model must be accepted by everyone as being universally correct. The development of parallel theories shows that this is not necessarily the case.

The bias mentioned above has led the CAPM to be considered as just one theoretical explanation for the functioning of the financial markets. Other theories and methods have been developed, but they have not (yet?) achieved the attractiveness of the CAPM, due to the simplicity of its concepts. We should not lose hope: a study by Ferguson and Shockley (2003) posits that all weaknesses of the CAPM could be attributable to a mis-estimation of the market portfolio and that they would disappear if not only stocks, but also bonds (and other investment opportunities), were included, as the theory suggests.

Section 19.4 MULTIFACTOR MODELS

1/ THE ARBITRAGE PRICING THEORY

In some ways the APT (arbitrage pricing theory) model is an extended version of the CAPM. The CAPM assumes that the return on a security is a function of its market risk and therefore depends on a single factor: market prices. The APT model, as proposed by Stephen Ross, assumes that the risk premium is a function of several variables, not just one, i.e. macroeconomic variables (V_1, V_2,…, V_n) as well as company "noise".

So, for security *J*:

$$r_J = a + b_1 \times r_{V_1} + b_2 \times r_{V_2} + \ldots + b_n \times r_{V_n} + \text{noise}$$

The model does not define which *V* factors are to be used. Ross's original article uses the following factors, which are based on quantitative analyses: inflation, manufacturing output, risk premium and yield curve.

Comparing the APT model to the market portfolio, we can see that APT has replaced the notion (hard to measure in practice) of return expected by the market with a series of variables which, unfortunately, must still be determined. This is why APT is a portfolio management tool and not a tool for valuing stocks.

2/ THE FAMA–FRENCH MODEL

There are offshoots from the APT that have sought to explain historical returns by company-specific factors rather than the general macroeconomic factors in the APT.

For example, Eugene Fama and Kenneth French (1992) have isolated three factors: market return (as in the CAPM), price/book value (see Chapter 31) and the gap in returns between large caps and small caps (which lends credence to the notion of a liquidity effect).

Other factors can be added to this list, including P/E, market capitalisation, yield and even past performance (which is a direct contradiction of efficient market theory). However, these are based on purely empirical approaches,

not theoretical ones. While they criticise the CAPM, they offer no better alternative model.

3/ LIQUIDITY PREMIUM, SIZE PREMIUM AND INVESTOR PROTECTION

Among the factors used in determining risk, the criteria by which liquidity can be measured (size, free float, transaction volumes, bid–ask spread) are often statistically significant. In other words, the required return on a security often appears to be a function of liquidity.

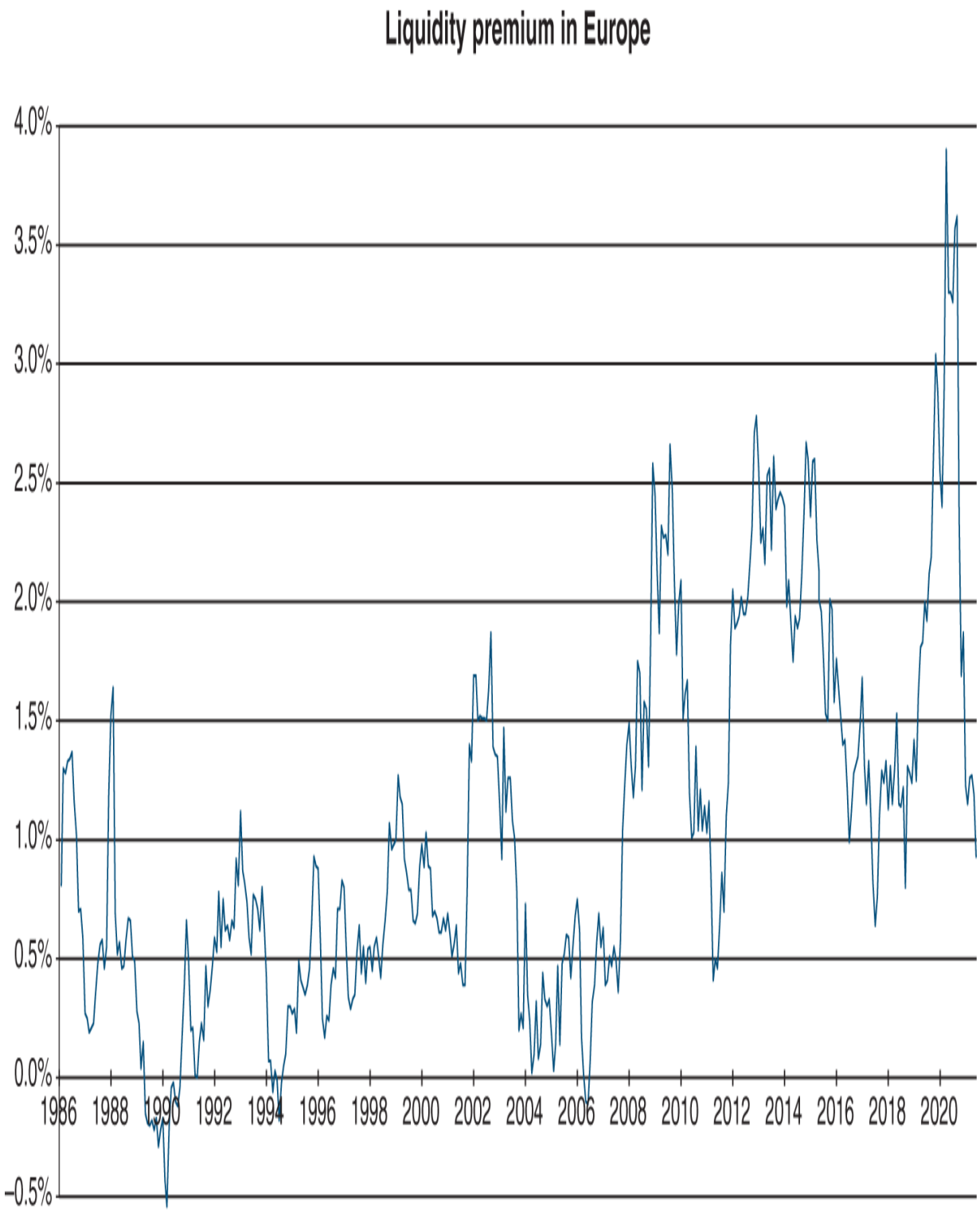
Hamon and Jacquillat (1999) have demonstrated the existence of a liquidity premium in Europe, which is nil for large caps and significant for small caps. The liquidity premium should be added to the return derived from the CAPM to arrive at the total return expected by the shareholder. Hamon and Jacquillat use the term “market plane” (instead of securities market line). Under their model, expected return on a security is a linear equation with two parameters: the market premium and the liquidity premium. Let us report the definition from the original article:

$$k = r_F + \beta \times (k_M - r_F) + \lambda \times \text{Liquidity premium}$$

In May 2020, Associés en Finance estimated the market plane parameters for eurozone stocks at:

$$k = -0.92\% + \beta \times 6.33\% + \lambda \times 0.82\%$$

The liquidity premium, which is expected in addition to the required rate of return, finds its opposite number in the notion of “liquidity discount”.



Source: Data from Associés en Finance

Section 19.5 FRACTALS AND OTHER LEADS

The theory of a market in equilibrium is based on the assumption that prices have reached an equilibrium. It therefore assumes that there is an equilibrium between offer and demand and that it is reached at every moment on financial markets (thanks to the arbitrage principle). From this equilibrium, no one can predict how prices will move: they follow a random path.

Some research proposes that market prices do not follow random paths as the market in equilibrium theory predicts. In particular, extreme events (strong price growth or large drops) occur much more frequently than would be predicted by classical theory.

Several theories have been developed to model the evolution of prices and allow for possible massive price movements (in particular, crashes).

Some have tried to use chaotic functions to model prices. Chaotic here does not mean illogical or random. The term is used for perfectly predictable series of data that appear to be illogical. These models are used in a number of sciences, including economics.

Mandelbrot has put forward that fractals (or to be more precise, multi-fractals) could provide accurate representations of market price movements. This assumption does not fit with the efficient market theory, not only because the statistical rule for modelling prices is different, but more importantly because Mandelbrot's assumptions imply that prices have memory, i.e. that they are not independent from past prices.

Section 19.6 TERM STRUCTURE OF INTEREST RATES

Because it is a single-period model, the CAPM draws no distinction between short-term and long-term interest rates. As has been discussed, a money-market fund does not offer the same annual rate of return as a 10-year bond. An entire body of financial research is devoted to understanding movements in interest rates and, in particular, how different maturities are linked. This is the study of how the yield curve, which at a point in time relates the yield to maturity to the maturity (or duration) of bonds, is formed.

1/ THE VARIOUS YIELD CURVES

By charting the interest rate for the same categories of risk at all maturities, the investor obtains the yield curve that reflects the anticipation of all financial market operators.

The concept of premium helps explain why the interest rate of any financial asset is generally proportional to its maturity.

Generally speaking, the yield curve reflects the market's anticipation regarding:

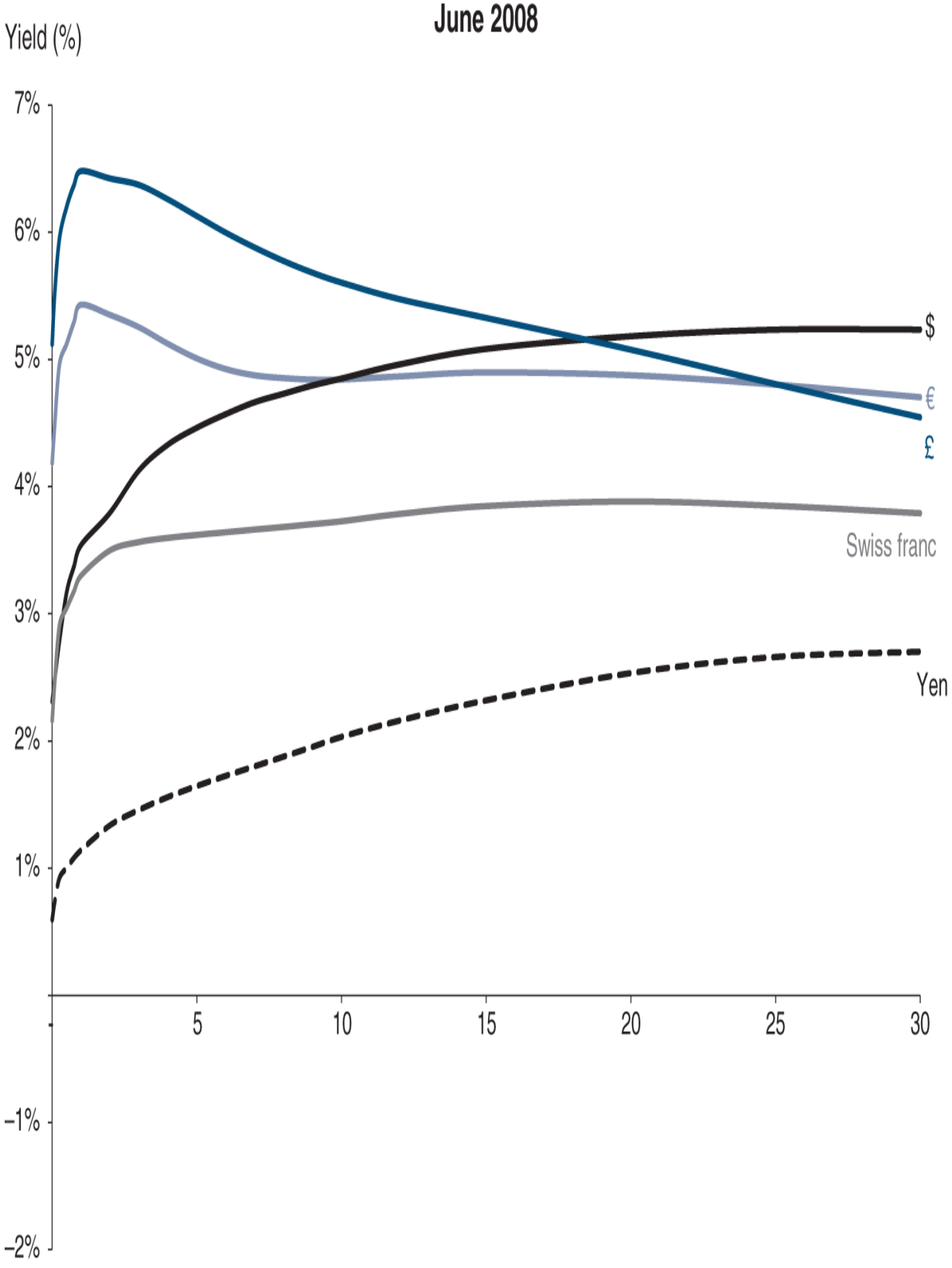
long-term inflation;

the central bank's monetary policy; and

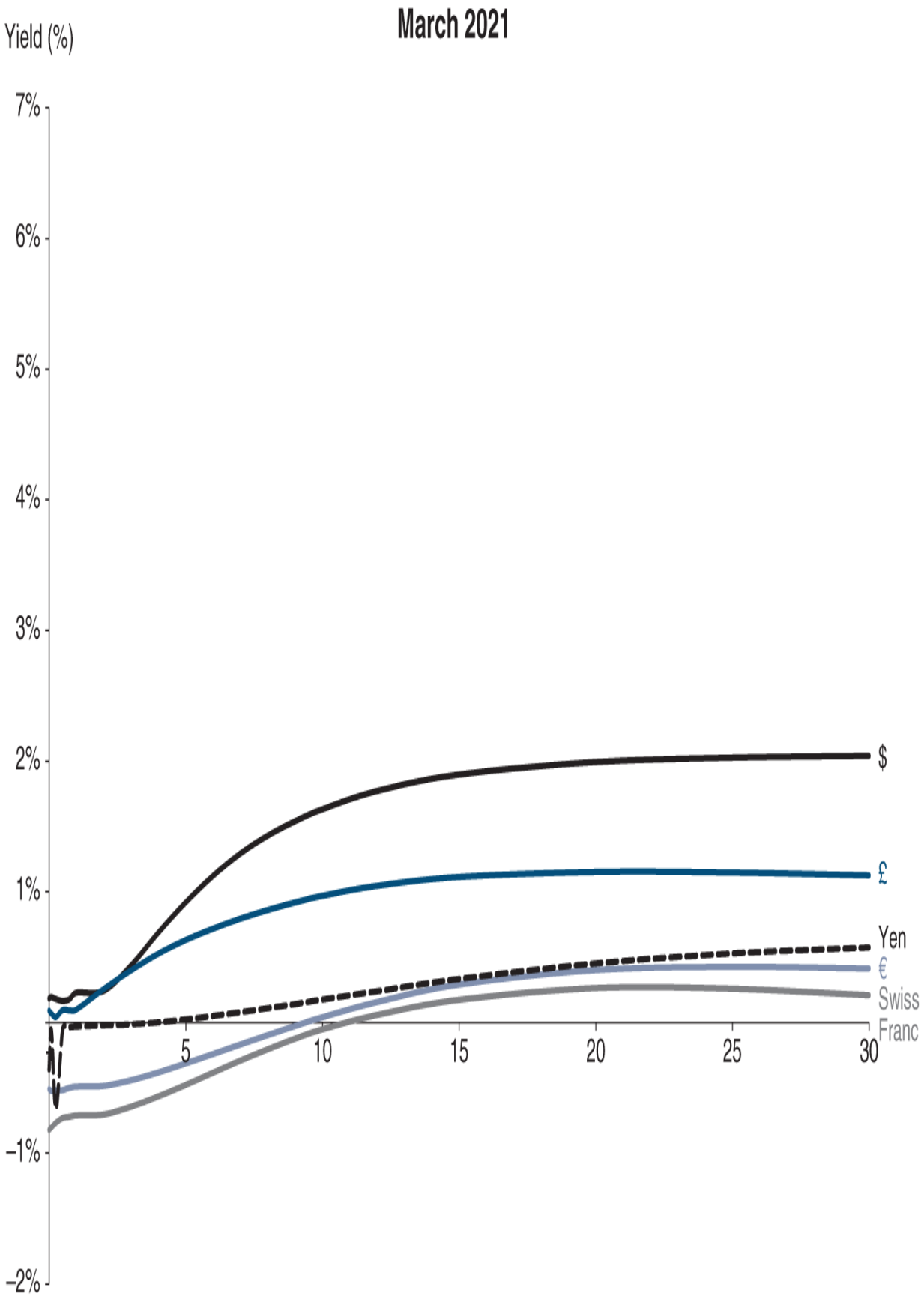
the issuing country's debt management policy.

Some yield curves

June 2008



Source: Data from Datastream, Bloomberg


March 2021
Yield (%)
7%
6%
5%
4%
3%
2%
1%
−1%
−2%
5
10
15
20
25
30
$
£
Yen
€
Swiss
Franc

Source: Data from Bloomberg

Hence, during a period of economic recovery, the yield curve tends to be “normal” (i.e. long yields are higher than short yields). The steepness of the slope depends on:

how strong an expected recovery is;

what expectations the market has about the risk of inflation; and

the extent to which the market expects a rapid increase in central banks' intervention rates (to calm inflationary risks).

For the euro, the curve's upward slope in 2021 is due to the extremely low (currently negative) levels reached by short-term rates, following European Central Bank (ECB) interventions to avoid a major economic downturn and to support the economy.

In contrast, when a recession follows a period of growth, the yield curve tends to reverse itself (with long-term rates falling below short-term rates). The steepness of the negative slope depends on:

how strong expectations of recovery are;

how credible the central bank's policy is (i.e. how firm the central banks are in fighting inflation); and

the extent to which inflationary trends appear to be diminishing (despite the recession, if inflationary trends are very strong then long-term rates will tend to remain stable, and the curve could actually be flat for some time).

This is what could be observed at the beginning of 2021 in relation to the dollar.

Lastly, when rates are low, the curve cannot remain flat for any length of time because investors will buy fixed-rate bonds. As long as investors expect that their capital gain, which is tied to falling long-term rates, is more than the cost of short-term financing, they will continue to purchase fixed-rate bonds. However, when long-term rates seem to have reached a lower limit, these expectations will disappear because investors will demand a differential between long-term and short-term rates' yield on their investment. This results in:

either a rebound in long-term rates; or

stable long-term rates if short-term rates fall because of central bank policies; and

a steepening in the curve, the degree of which will depend on the currency.

We then revert to the upward slope since the end of 2008 for the Swiss franc.

2/ RELATIONSHIP BETWEEN INTEREST RATES AND MATURITIES

By no means are short-term and long-term rates completely disconnected. In fact, there is a fundamental and direct link between them.

About 20 years ago, this relationship was less apparent and common consensus favoured the **theory of segmentation**, which said that supply and demand balanced out across markets, with no connection among them, i.e. the long-term bond market and the short-term bond market.

As seen above, this theory is generally no longer valid, even though each investor will tend to focus on their own timeframe. It is worthwhile reviewing the basic mechanisms. For example, an investor who wishes to invest on a two-year time basis has two options:

invest for two years at today's fixed rate, which is the interest rate for any two-year investment; or

invest the funds for one year, is paid the one-year interest rate at the end of the year, and then repeat the process.

In a **risk-free environment**, these two investments would produce the same return, as the investor would already know the return that they would be offered on the market in one year for a one-year bond. As they also know the current one-year rate, they can determine the return on a two-year zero-coupon bond.

$$(1 + {}_0r_2)^2 = (1 + {}_0r_1) \times (1 + {}_1r_1)$$

where ${}_0r_2$ is the current two-year rate, ${}_1r_1$ the one-year rate in one year and ${}_0r_1$ the current one-year rate.

Hence:

$$(1 + {}_0r_2) = \sqrt{(1 + {}_0r_1) \times (1 + {}_1r_1)}$$

If today the one-year interest rate is 3% and the two-year interest rate is 4%, this means that the market expects the one-year interest rate to reach 5% in one year, as

$$1.04 = \sqrt{1.03 \times (1 + {}_1r_1)} \text{ therefore } {}_1r_1 = \frac{1.04^2}{1.03} - 1 = 5\%$$

An increase in short-term rates is then anticipated by the market.

> Long-term rates are the geometrical average of short-term rates anticipated in the future.

In such a world, the shape of the yield curve provides some valuable information. For example, if long-term rates are higher than short-term rates, this necessarily implies that investors are anticipating an increase in interest rates.

This theory assumes that investors are not sensitive to risk and therefore that there is no preference for a short-term or a long-term investment. This does not deal with the attention that investors pay to liquidity, as demonstrated by recent events on financial markets.

3/ TAKING LIQUIDITY INTO CONSIDERATION

The first theories to highlight the existence of a premium to reflect the relative lack of liquidity of long-term investments were the **preferred habitat theory** and the **liquidity preference theory**.

In the mid-1960s, Modigliani and Sutch advanced the theory of preferred habitat, which says that investors prefer certain investment timeframes. Companies that wish to issue securities whose timeframe is considered undesirable will thus have to pay a premium to attract investors.

The theory of liquidity preference is based on the same assumption, but goes further in assuming that the preferred habitat of all investors is the short term. Investors preferring liquidity will require a liquidity premium if they are to invest for the long term.

Hence, long-term rates will be the geometric average of anticipated short-term rates increased by a liquidity premium normally increasing with maturity.

Even if investors anticipate fixed short-term rates, the yield curve will slope upward due to the liquidity premiums.

4/ YIELD CURVES AND VALUATION OF SECURITIES

After having studied the yield curve, it is easier to understand that the discounting of all the cash flows from a fixed-income security at a single rate, regardless of the period when they are paid, is an oversimplification, although this is the method that will be used throughout this text for stocks and capital expenditure. It would be wrong to use it for bonds.

In order to be more rigorous, it is necessary to discount each flow with the interest rate of the yield curve corresponding to its maturity: the one-year rate for next year's income stream, the three-year rate for flows paid in three years, etc. Ultimately, yield to maturity is similar to an average of these different rates.

SUMMARY

The summary of this chapter can be downloaded from www.vernimmen.com.

This chapter has shown how to work out the cost of equity, i.e. the rate of return required on equity capital. The investor's required rate of return is not linked to total risk, but solely to market risk. Conversely, in a market in equilibrium, intrinsic – or diversifiable – risk is not remunerated.

The CAPM is used to determine the rate of return required by an investor.

Risk-free rate + β × market risk premium, or:

$$k = r_F + \beta \times (k_M - r_F)$$

Although the CAPM is used universally, it does have drawbacks that are either practical (for reliable determination of beta coefficients and market premium) or fundamental in nature (since it supposes that markets are in equilibrium). This criticism has led to the development of new models, such as the APT, and has highlighted the importance of the liquidity premium for groups with small free floats. Like the CAPM, the APT assumes that the required rate of return no longer depends on a single market rate; however, it considers a number of other variables too, such as the difference between government bonds and Treasury bills, unanticipated changes in the growth rate of the economy or the rate of inflation, etc.

Rates of return on bonds with different maturity dates can be plotted on a graph known as the yield curve. The shape of the yield curve depends on changes in expectations about short-term rates and the liquidity premium that investors will require for making a long-term investment. In a risk-free environment, the long-term rate at *n* years is a geometric average of short-term rates anticipated for future periods. Generally, there is a positive link between the interest rate of a financial asset and its duration, which is where the rising yield curves come from. However, the yield curve can also slope the other way, especially during a recession.

QUESTIONS

1/Explain in a few lines why diversifiable risk cannot be remunerated on markets in equilibrium.

2/Given that diversifiable risk is not remunerated, would it be worthwhile to diversify an investment?

3/What is the rate of return required by the shareholder equal to?

4/What is the drawback of the β coefficient?

5/A shareholder requires a rate of return that is twice as high on a share with a β coefficient that is twice as high as that of another share. True or false?

6/What does a low risk premium indicate?

7/On the graph in Section 19.2, does the Criteo share seem under- or overvalued to you? What about the Sanofi share?

8/What is the strong point of the APT compared with the CAPM? And the weak point?

9/Will liquidity premiums tend to rise or fall during a crash? Why?

10/What does a reduced liquidity premium indicate?

11/The standard deviation of the earnings on State Bank of India shares is 40%, while for Siemens it is only 28%. However, State Bank of India has a β of 1.13 and Siemens is 1.7. Explain how this is possible.

12/Explain why an investor would be prepared to require a return lower than the risk-free rate for a share with a negative β.

13/How do you explain the fact that rates of return required by investors may be identical for two groups of totally different activities (oil and IT services, for example) as long as they have the same β?

14/An experiment was recently carried out where a child, an astrologer and a financial analyst were each given €10,000 to invest for eight years. Who do you think achieved the best results?

15/Mid-2021 we could see that large food-processing groups (Danone, Nestlé, Unilever) were valued at 12 times their expected 2021 EBITDA. For smaller groups in the same sector (Savencia, Bonduelle, Ebro) the ratio was only 7. State your views.

16/What is the difference between the zero-coupon curve and the yield curve?

17/Why is a yield curve showing higher long-term interest rates than short-term rates (rising curve) called a normal curve?

18/What risk are we talking about when we say that government bonds are risk-free?

19/What is the “reinvestment risk”?

20/On a market where no zero-coupon bond is traded, can you determine the two-year interest rate if you know the one-year interest rate and the price of a two-year bond? And then the three-year interest rate?

21/And if you do not know the interest rate at one year?

You'll find more questions at www.vernimmen.com.

EXERCISES

1/What rate of return should be required on the Vodafone share, which has a β of 0.7, if the Rio Tinto share, which has a β of 1.1, returns 8% and is correctly valued, and the rate of a risk-free asset is 0.5%?

2/Are the following shares undervalued, correctly valued or overvalued? The rate for a risk-free asset is 5.5% and the market risk premium is 4%.

Share	Imperial Tobacco	Rémy Cointreau	AB Inbev	Axa	Nokia
β	0.34	0.77	0.92	1.21	1.4
Rate of return	3.5%	5.4%	5%	9.2%	14%

3/You think that the Lapparent.com share will be worth €40 in one year. What price would you be prepared to pay today if the no-risk cash rate is 5%, the market rate of return is 9% and the β is 2.7?

4/Your portfolio has a β of 1.2, the risk-free rate is 5.6% and the risk premium is 3%. In this chapter you learned about the APT and were told that the two V factors are growth of GDP and unanticipated inflation. The equation for the model is: $r_j = 5.6\% + b_{j1} \times 2\% + b_{j2} \times 5\%$. Suppose that the sensitivity of your portfolio to GDP growth is −0.4, what is your portfolio's sensitivity to unanticipated inflation? You believe that a recession is looming and you wish to eliminate your portfolio's sensitivity to GDP growth but you still want to get the returns you expected. What happens to your portfolio's sensitivity to unanticipated inflation?

ANSWERS

Questions

1/*Because if it were remunerated, this would be an “unwarranted” gain.*

2/*Yes, in order to eliminate it, given that it is not remunerated.*

3/*Risk-free rate + market risk premium.*

4/*Its instability.*

5/*No, because this would be forgetting the constant (the risk-free cash rate) in the equation for the required rate of return.*

6/*That the market may be about to take a steep dive because risk is not being adequately rewarded.*

7/*Criteo: overvalued, because the required rate of return, given the risk, is too low. It will thus rise, causing the share price to fall. Sanofi is on the “securities market line” and is therefore correctly valued.*

8/*Analysis of the market return in different components. The degree of precision required, because risk premiums by factor and the associated betas are difficult to estimate.*

9/*To rise, because investors will only wish to invest in very liquid shares that they can sell immediately.*

10/*It's a good thing for small companies, generally growing rapidly, which are in fashion at the time.*

11/*The standard deviation is explained both by the market risk and the specific risk of the share, while the β only reflects the market risk of the share. State Bank of India thus has a very high specific risk.*

12/*These types of shares are very rare and very valuable, because they go up when the market falls! Their marginal contribution to the reduction of a portfolio's risk is thus strong.*

13/*Because what is important in the CAPM is not the specific risk but the market risk of each security.*

14/*The child. If markets are really efficient, the answer is completely random.*

15/*It is due to the liquidity premium, as the required rate of return will be higher on smaller companies and their multiple of future earnings will be lower.*

16/*The yield curve is drawn directly, taking into account the maturity but without adjusting the coupon of each bond. The zero-coupon curve is recalculated and can be used directly for valuing a security.*

17/*The preference for liquidity means that in normal circumstances (i.e. when anticipated changes in the inflation rate do not interfere), long-term rates are higher than short-term rates.*

18/*There is no economic risk of the issuer going bankrupt.*

19/*The risk of reinvesting coupons and changes in the rate of inflation (risk of losing purchasing power).*

20/*Knowing the one-year interest rate and the price of a bond with a two-year maturity, you can draw an equation with only the two-year interest rate unknown. Once you know the two-year interest rate, you can use a bond with a three-year maturity and the same methodology to derive the three-year interest rate.*

21/*You will need to use the price of two different bonds with the same two-year maturity and have two equations with two unknown elements: the one-year and two-year interest rates.*

Exercises

A detailed Excel version of the solutions is available at www.vernimmen.com.

1/*Risk premium: (8% − 0.5%) / 1.1 = 6.8%. k = 0.5% + 0.7 × 6.8% = 5.3%.*

2/*Undervalued: Imperial Tobacco, Axa, Nokia. Nokia shares are expected to yield 0.5% + 1.4 × 6.5% = 9.6%. Since Nokia's share is expected to yield 14%, investors will buy Nokia's share, which will raise its price and converge the expected rate of return (14%) to the theoretical rate of return of 9.6%. Correctly valued: Rémy Cointreau. Overvalued: AB Inbev*

3/*€40/(5% + 2.7 × (9% − 5%) + 1) = €34.54.*

4/*r = 5.6% + 1.2 × 3% = 9.2%. (9.2% − 5.6% + 2% × 0.4)/5% = 0.88. (9.2% − 5.6%)/5% = 0.72.*

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NOTES

1 *However, the very fact that the entrepreneur does not diversify their portfolio means that they must achieve strong performances in managing their company, as they have everything to lose. So they are likely to take steps to reduce risk.*

2 *For the risk-free rate, k_F is equal to r_F. The required rate of return is equal to the return that is actually received, as the asset has no risk.*

3 *It differs from the capital market line, which has the total risks of the security on the x-axis, not the β coefficient.*

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PART THREE
FINANCIAL SECURITIES

There is a great variety of financial instruments, each of which has the following characteristics:

it is a contract …

… executed over time, and …

its value derives solely from the series of cash flows it represents.

Indeed, from a mathematical and more theoretical viewpoint, a financial instrument is defined as a **schedule of future cash flows**.

Holding a financial security is the same as holding the right to receive the cash flows, as defined in the terms and conditions. Conversely, for the issuer, creating a financial instrument is the same as committing to paying out a series of cash flows. In return for this right to receive cash flows or for taking on this commitment, the company will issue a security at a certain price, enabling it to raise the funds needed to run its business.

A financial security is a contract …

You've undoubtedly heard people say that the financial manager's stock-in-trade is “paper”. Digitalisation has now turned financial instruments from paper documents into intangible book entries, reducing them to the information they contain, i.e. the contract. The essence of finance is, and will always be, **negotiation** between an issuer seeking new funds and the investors interested in buying the instruments that represent the underlying obligations. And negotiation means markets, be they credit markets, bond markets, stock markets, etc.

… executed over time …

Time, or the term of the financial security, introduces the notion of time remuneration and **risk**. A debt instrument that promises cash flows over time, for example, entails risk, even if the borrower is very creditworthy. This seems strange to many people who consider that “a deal is a deal” or “a person's word is their bond”. Yet, experience has shown that a wide variety of risks can affect the payment of those cash flows, including political risk, strikes, natural disasters, pandemics and other events.

… and materialised by cash flows.

The financial logic that we have seen in the previous chapters is used to analyse and choose among a firm's investment options. The financial manager transforms flows of goods and services, deriving from the company's industrial and other business assets, into cash flows. You will soon understand that the world of finance is one of **managing rights on the one hand and commitments on the other, both expressed in terms of cash flows**.

In a market for financial instruments, it is not the actual flows that are sold, but the rights associated with them. The investor, i.e. the buyer of the security, acquires the rights granted by the instrument. The issuing company assumes contractual obligations deriving from the instrument, regardless of who the owner of the instrument is.

For example, commodity futures markets make it possible to perform purely financial transactions. You can buy sugar “forward”, via financial instruments called futures contracts, knowing full well that you will never take delivery of the sugar into your warehouse. Instead, you will close out the position prior to maturity. The financial manager thus trades on a market for real goods (sugar), using contracts that can be unwound prior to or at maturity.

A property investor acts similarly. After acquiring real property, the value of which fluctuates, they can lease it or resell it. Viewed this way, real property is as fungible as any other property and is akin to a financial asset.

Clearly, these assets exhibit different degrees of “financiality”. To take the argument one step further, you turn a painting into a financial instrument when you put it in your safe in the hope of realising a gain when you sell it.

The distinction between a real asset and a financial asset is therefore subtle but fundamental. It lies either in the nature of the contract or in the investor's motivation, as in the example of the painting.

Lastly, the purchase of a financial security differs from the purchase of a durable good in that the financial security is undifferentiated. A large number of investors can buy the same financial security. In contrast, acquiring a specific office building or building an industrial plant is a very specific, unique investment.

In conclusion, every financial instrument represents a series of cash flows to be received according to a set timetable. Mathematically, it can be expressed as a series of future cash flows F_1, F_2, F_3, F_4, …, F_n over n periods.

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Chapter 20
BONDS

Fixing the interest

Unlike equity, for which shares are the legal form of the security, bank and financial debt can take the form of bank loans or debt securities. The predominant form of debt securities is a bond.

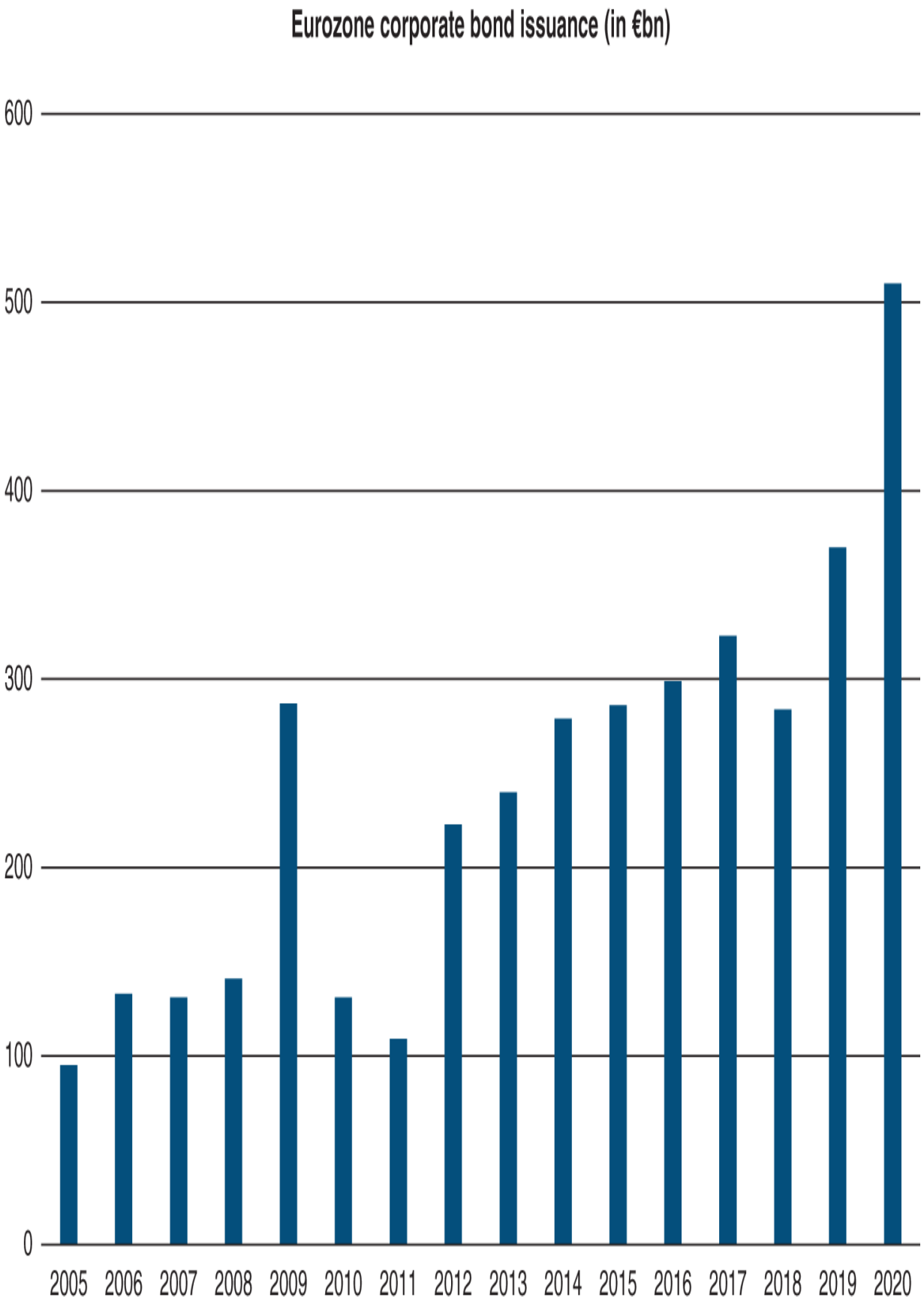
A debt security is a financial instrument representing the borrower's obligation to the lender from whom they have received funds. If the initial maturity of the security is over one year, it will be called a bond.

This obligation provides for a schedule of cash flows defining the terms of repayment of the funds and the lender's remuneration in the interval. The remuneration may be fixed during the life of the debt or floating if it is linked to a benchmark or index.

Unlike conventional bank loans, debt securities can be traded on secondary markets (stock exchanges, money markets, mortgage markets, interbank markets, over the counter (OTC) markets). Other than this, their logic remains the same and all the reasoning presented in this chapter also applies for bank loans. Debt securities are bonds, commercial paper, Treasury bills and notes, certificates of deposit and mortgage-backed bonds or mortgage bonds. Furthermore, the current trend is to securitise loans to make them negotiable.

Disintermediation was not the only factor fuelling the growth of bond markets. The increasing difficulty of obtaining bank loans was another, as banks realised that the interest margin on such loans did not offer sufficient return on equity. This pushed companies to turn to bond markets to raise the funds that banks had become reluctant to advance. The increasingly burdensome solvency and liquidity constraints imposed on banks (Basel III and IV) has increased the share of financing insured by the debt capital markets even further (see Chapter 39).

Investors have welcomed the emergence of corporate bonds offering higher yields than government bonds. Of course, these higher returns come at the cost of higher risks.


Eurozone corporate bond issuance (in €bn)
600
500
400
300
200
100
0
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020

Even though the volume of corporate bond issuances is experiencing strong growth, they still only represent 35% of all eurozone bonds, far behind governments (45%) but ahead of financial institutions (20%).

Source: Data from BNP Paribas

Many of the explanations and examples offered in this chapter deal with bonds, but they can easily be applied to all kinds of debt instruments. We shall take the example of the Ahold Delhaize 2030 bond issue with the following features:

AHOLD DELHAIZE 0.375% MARCH 2030 BOND ISSUE

Amount:	€600,000,000
Denomination:	€100,000
Issue price:	99.63% or €99,630 per bond, payable in one instalment on the settlement date
Date of issue:	18 March 2021
Settlement date:	18 March 2021
Maturity:	9 years
Annual coupon:	0.375%, i.e. €375 per bond payable in one instalment on 18 March of each year, with the first payment on 18 March 2022. If Ahold Delhaize does not reduce its carbon emissions by 29% and food waste by 32% by 2025, then the 2026 and subsequent coupons increase to 0.625%
Yield to maturity for the subscriber:	0.417% on the settlement date
Normal redemption date:	The bonds will be redeemed in full on 18 March 2030 at par value
Guarantee:	None
Rating:	BBB (Standard & Poor's), Baa1 (Moody's)
Listing:	Euronext Amsterdam

Section 20.1 BASIC CONCEPTS

1/ THE PRINCIPAL

(a) Nominal or face value

Loans that can be publicly traded are divided into a certain number of units giving the same rights for the same fraction of the debt. *The nominal, face or par value is €100,000 in the Ahold Delhaize case*.

The nominal value is used to calculate the interest payments. In the simplest cases (which is not the case for Ahold Delhaize), it equals the amount of money the issuer received for each bond and that the issuer will repay upon redemption.

(b) Issue price

The issue price is the price at which the bonds are issued; that is, the price investors pay for each bond. *The Ahold Delhaize bond was issued on 18 March 2021 at a price of €99,630, i.e. 99.63% of its face value*.

Depending on the characteristics of the issue, the issue price may be higher than the face value (issued at a premium), lower than the face value (issued at a discount) or equal to the face value (at par).

(c) Redemption

When a loan is amortised, it is said to be redeemed. In Chapter 17 we looked at the various ways a loan can be repaid:

redemption at maturity, or on a bullet repayment basis. *This is the case in the Ahold Delhaize issue*;

redemption in equal slices (or series), or constant amortisation;

redemption in fixed instalments.

Other methods exist, such as determining which bonds are redeemed by lottery… there is no end to financial creativity!

A **deferred redemption period** is a grace period, generally at the beginning of the bond's life, during which the issuer does not have to repay the principal.

The terms of the issue may also include provisions for **early redemption** (call options) or retraction (put options). A call option (see Chapter 23) gives the issuer the right to buy back all or part of the issue prior to the maturity date, while a put option allows the bondholder to demand early repayment.

A **redemption premium or discount** arises where the redemption value is higher or lower than the nominal value.

(d) Maturity of the bond

The life of a bond extends from its issue date to its final redemption date. Where the bond is redeemed in several instalments, the **average maturity** of the bond corresponds to the average of each of the repayment periods.

The Ahold Delhaize bonds have a maturity of nine years.

(e) Guarantees

Repayment of the principal (and interest) on a bond borrowing can be guaranteed by the issuer, the parent company and less often for corporates by collateral (i.e. mortgages), pledges or warranties. Bonds are rarely secured, while commercial paper and certificates of deposit can, in theory, be secured but in fact never are.

The bonds issued by Ahold Delhaize do not benefit from a guarantee.

2/ INCOME

(a) Issue date

The issue date is the date on which interest begins to accrue. It may or may not coincide with the **settlement date**, when investors actually pay for the bonds purchased.

In the case of the Ahold Delhaize bond, these two dates coincide. Interest begins to accrue on the settlement date.

(b) Interest rate

The coupon or nominal rate is used to calculate the interest (or coupon, in the case of a bond) payable to the lenders. Interest is calculated by

multiplying the nominal rate by the nominal or par value of the bond.

On the Ahold Delhaize issue, the coupon rate is 0.375% and the coupon payment is €375. However, if Ahold Delhaize did not reduce its carbon emissions by 29% between 2018 and 2025 (scope 1 and 2) and its food waste (discarded food) by 32% between 2016 and 2025, then the annual coupon would increase to €625. This provision makes this bond a sustainable one.

In addition to coupon payments, investors may also gain additional remuneration if the issue price is lower than the par value (*which is the case for Ahold Delhaize*). This is the issuance premium. If the issue price is higher than the par value, the lender's return will be lower than the coupon rate.

(c) Periodicity of coupon payments

Coupon payments can be made every year, half-year, quarter, month or even more frequently. On certain borrowings, the interval is longer, since the total compounded interest earned is paid only upon redemption. Such bonds are called **zero-coupon bonds**.

In some cases, the interest is **prepaid**; that is, the company pays the interest at the beginning of the period to which it relates. In general, however, the **accrued** interest is paid at the end of the period to which it relates.

The Ahold Delhaize issue pays accrued interest on an annual basis.

Section 20.2 THE YIELD TO MATURITY

The actual return on an investment (or the cost of a loan for the borrower) depends on a number of factors: the difference between the settlement date and the issue date, the issue premium/discount, the redemption premium/discount, the deferred redemption period and the coupon payment interval. As a result, the nominal rate is not very meaningful.

We have seen that the **yield to maturity** (Chapter 17) cancels out the bond's present net value; that is, the difference between the issue price and the present value of future flows on the bond. **Note that for bonds, the yield to maturity (*y*) and the internal rate of return are identical.** This yield, calculated on the settlement date when investors pay for their bonds, takes into account any timing differences between the right to receive income and the actual cash payment.

In the case of the Ahold Delhaize bond issue:

$$99.63\% - \left(\sum_{i=1}^{9} \frac{0.375\%}{(1+y)^i} + \frac{100\%}{(1+y)^9} \right) = 0$$

i.e. $y = 0.417\%$. The yield to maturity, before taxation and intermediaries' fees, represents:

for investors, the rate of return they would receive by holding the bonds until maturity, assuming that the interest payments are reinvested at the same yield to maturity, which is a very strong assumption;

for the issuer, the pre-tax actuarial cost of the loan.

From the point of view of the investor, the bond schedule must take into account intermediation costs and the tax status of the income earned. For the issuer, the gross cost to maturity is higher because of the commissions paid to intermediaries. This increases the actuarial cost of the borrowing. In addition, the issuer pays the intermediaries (**paying agents**) in charge of paying the interest and reimbursing the principal (generally between 0.2 and 0.4% on the Euro Investment Grade market). Lastly, the issuer can deduct the coupon payments in whole or in part to compute its corporate income tax, thus reducing the actual cost of the loan.

1/ SPREADS

The spread is the difference between the rate of return on a bond and that on a benchmark used by the market. In the eurozone, the benchmark for long-term debt is most often the interest rate swap (IRS) rate[1]; sometimes the spread to government bond yields is also mentioned. For floating-rate bonds and bank loans (which are most often with floating rates), the spread is measured to a short-term rate, the three- or six-month Euribor in the eurozone.

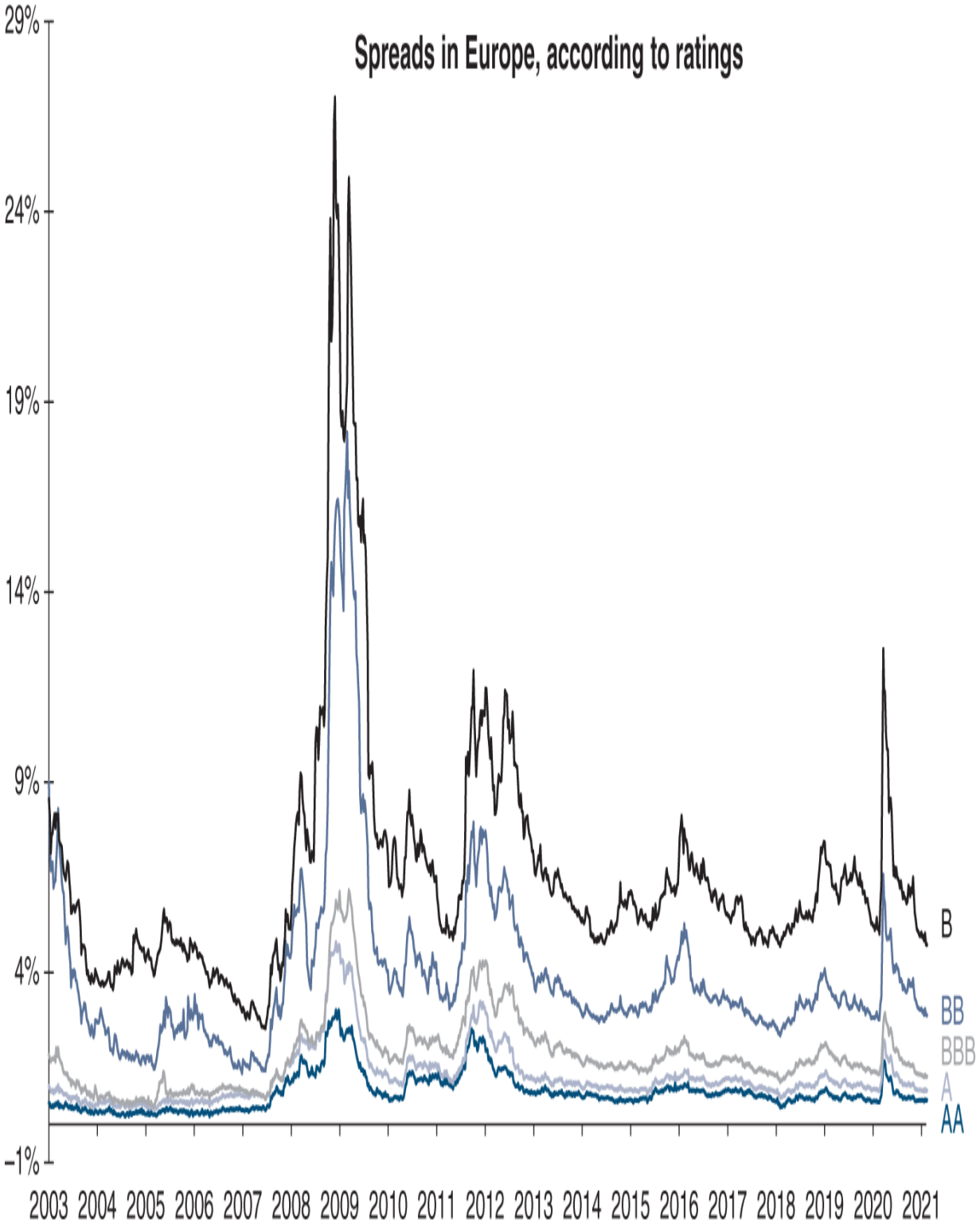
The Ahold Delhaize bond was issued with a spread of 41 basis points (0.41%) to mid swap rate, meaning that Ahold Delhaize had to pay 0.41% more per year than the risk-free rate to raise funds.

The spread is a key parameter for valuing bonds, particularly at the time of issue. It depends on the perceived credit quality of the issuer and the maturity of the issue, which are reflected in the credit rating and the guarantees given. Spreads are, of course, a relative concept, depending on the bonds being compared. The stronger the creditworthiness of the issuer and the market's appetite for risk, the lower the margin will be.

2/ THE SECONDARY MARKET

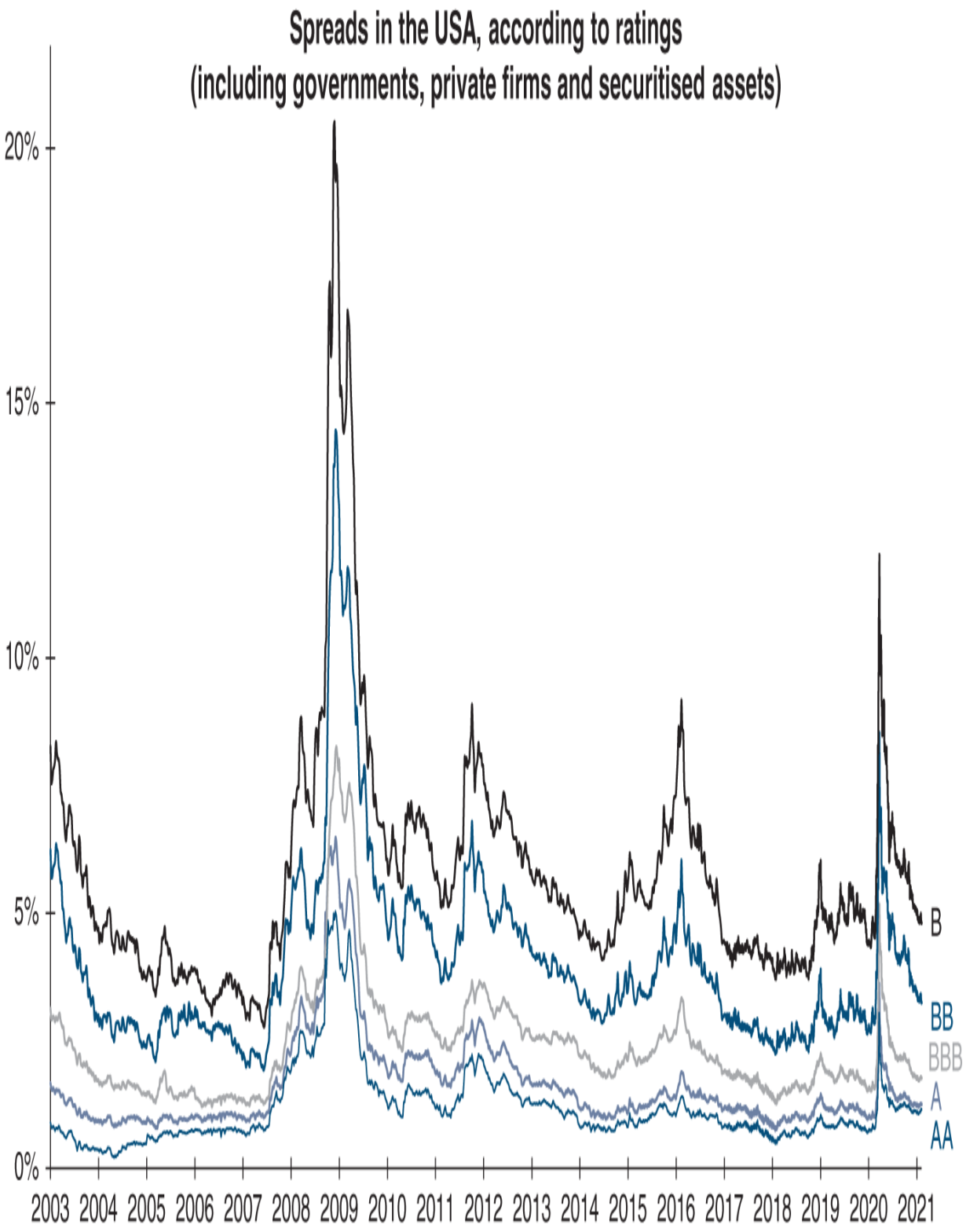
Once the subscription period is over, the price at which the bonds were sold (their issue price) becomes a thing of the past. The value of the instrument begins to fluctuate on the secondary market. Consequently, the yield to maturity published in the prospectus applies only at the time of issue; after that, it fluctuates in step with the value of the bond. Note that, as with equity issues, there is usually a small increase in the price of bonds just after they are issued (the price is said to be tightening). New issues usually offer a small yield premium (new issue premium)

Theoretically, changes in the bond's yield to maturity on the secondary market do not directly concern the borrower, since the cost of the debt was fixed when it was contracted.



Spreads tend to widen markedly during a crisis (like in 2008–2010), both in absolute terms and relative to each other.

Source: Data from Datastream/Factset



Source: Data from Datastream/Factset

For the borrower, the yield on the secondary market is merely an **opportunity cost**; that is, the **cost of refunding** for issuing new bonds. It represents the "real" cost of debt, but is not shown in the company accounts where the debt is recorded at its historical cost, regardless of any fluctuations in its value on the secondary market. The market value of debt can only be found in the notes to IFRS accounts.

3/ LISTING TECHNIQUES

The price of bonds listed on stock markets is expressed as a percentage of the nominal value. In fact, they are treated as though the nominal value of each bond were €100. Thus, a bond with a nominal value of €50,000 will not be listed at €49,500 but at 99% (49,500 / 50,000 × 100). Similarly, a bond with a nominal value of €10,000 will be listed at 99%, rather than €9,900. This makes it easier to compare bond prices.

For the comparison to be relevant, the prices must not include the fraction of annual interest already accrued. Otherwise, the price of a bond with a 5% coupon would be 105 just before its coupon payment date and 100 just after. This is why bonds are quoted **net of accrued interest**. Bond tables thus show both the price expressed as a percentage of the nominal value and the fraction of accrued interest, which is also given as a percentage of the nominal value.

On 5 May 2021, the Ahold Delhaize bond traded at 99.2% with 0.042% accrued interest. Buying the Ahold Delhaize bond then would have cost (excl. any trading fee or tax) €99,242: €100,000 × (99.2% + 0.042%).

Certain debt securities, mainly fixed-rate Treasury notes with annual interest payments, are quoted at their yield to maturity.

By now you have probably realised that the price of a bond does not reflect its actual cost. A bond trading at 105% may be more or less expensive than a bond trading at 96%. **The yield to maturity is the most important criterion, allowing investors to evaluate various investment opportunities according to the degree of risk they are willing to accept and the length of their investment.** However, it merely offers a temporary estimate of the **promised** return; this may be different from the **expected** return, which incorporates the probability of default of the bond.

4/ FURTHER ISSUES AND ASSIMILATION

Having made one bond issue, the same company can later issue other bonds (informally, this is called a **tap issue**) with the same features (time to maturity, coupon rate, coupon payment schedule, redemption price and guarantees, etc.), so that they are interchangeable. This enables the various issues to be grouped as one for a larger total amount. Assimilation makes it possible to reduce administrative expenses and enhance liquidity on the secondary market.

Nevertheless, the drawback for the issuer is that it concentrates maturity on one date, which is not in line with sound financial policy.

Bonds assimilated are issued with the same features as the bonds with which they are interchangeable. The only difference is in the issue price,[2] which is shaped by market conditions that are very likely to have changed since the original issue.

Section 20.3 FLOATING-RATE BONDS

So far we have looked only at fixed-income debt securities. The cash flow schedule for these securities is laid down clearly when they are issued. These are very popular in periods of low interest rates, and currently represent 84% of euro-denominated bond issues. Let us now cover the various securities that give rise to cash flows that are not totally fixed from the very outset, but follow preset rules (10% of all bond issuances in 2020).

1/ THE MECHANICS OF THE COUPON

The coupon of a floating-rate bond (floating rate note, FRN or “floats”) is not fixed, but is indexed to an observable market rate, generally a short-term rate, such as a six-month Euribor. In other words, the coupon rate is periodically reset based on some reference rate plus a spread. When each coupon is presented for payment, its value is calculated as a function of the market rate, based on the formula:

$$\text{Coupon}_t = (\text{Market rate}_t + \text{Spread}) \times \text{Par value}$$

This cancels out the interest rate risk, since the issuer of the security is certain of paying interest at exactly the market rate at all times. Likewise, the investor is assured at all times of receiving a return in line with the market rate. Consequently, there is no reason for the price of a variable-rate bond to move very far from its par value unless the issuer's solvency changes.

> Consequently, floating-rate bonds are not highly volatile securities, even though their value is not always exactly 100%.

2/ INDEX-LINKED SECURITIES

Floating rates, as described in the first paragraph of this section, are indexed to a market interest rate. Broadly speaking, however, a bond's coupons may be indexed to any index or price provided that it is clearly defined from a contractual standpoint. Such securities are known as **index-linked securities**.

For instance, most European countries have issued bonds indexed to inflation. The coupon paid each year, as well as the redemption price, is reset to take into account the rise in the price index since the bond was launched. As a result, the investor benefits from complete protection against inflation. Likewise, Mexican companies have brought to market bonds linked to oil prices, while other companies have issued bonds indexed to their own share price.

The following table shows the main reference rates in Europe.

REFERENCE RATES IN EUROPE

Reference rate	Definition	As at April 2021
EONIA (Euro Overnight Index Average)	Traditional European money-market rate. Since end 2019 it is computed as €STR +8.5 basis points. It should disappear end 2021 and be replaced by €STR.	−0.42%
€STR (European Short-Term Rate)	The new European money-market rate that replaces EONIA. It is an interest rate computed based on real loans and not only declared loans as was EONIA.	–0.56%
EURIBOR (European Interbank Offered Rate)	European money-market rate corresponding to the arithmetic mean of offered rates on the European banking market for a given maturity (between 1 week and 12 months). Sponsored by the European Banking Federation and published by Reuters, it is based on daily quotes provided by 43 European banks.	−0.53% (3 months)

Reference rate	Definition	As at April 2021
LIBOR (London Interbank Offered Rate)	Money-market rate observed in London corresponding to the arithmetic mean of offered rates on the London banking market for a given maturity (between 1 and 12 months) and a given currency (euro, sterling, dollar, etc.). It will be replaced in 2021/2022 by ECB RFR (€), SONIA (£) and SOFR ($).	−0.54% (euro 3 months)
IRS	The IRS rate indicates the fixed interest rate that will equate the present value of the fixed-rate payments with the present value of the floating-rate payments in an interest rate swap contract. The convention in the market is for the swap market makers to set the floating leg – normally at Euribor – and then quote the fixed rate that is payable for that maturity.	

Section 20.4 GREEN AND SOCIALLY RESPONSIBLE BONDS

Responsible bonds include three categories of bonds that are, in terms of their financial flows, conventional bonds, but which incorporate ESG aspects.

The issuer of green bonds commits to use the funds for environmentally positive investments or expenditures (as defined by the company, usually assisted by an independent firm).

Tracking expenditure and allocating a funding source to a particular job requires a specific organisation that is unusual for finance management. This organisation has a cost. However, as investors have been willing to buy green bonds at a slightly higher price than a conventional bond since autumn 2020, the so-called greenium, the extra cost is more or less offset for companies. Green bonds are, even if companies sometimes deny it, a communication tool but also a means of internal mobilisation. Paradoxically, many green bond issuers operate in industries whose ecological character is not immediately obvious: energy (EDF, Engie), automotive (Toyota). Some have therefore launched the concept of transition bonds, which are bonds that specifically finance the energy transition.

The volume of green bond issues is growing very quickly, but remains modest (€265bn in 2020) compared to the bond market (around 5%).

Social bonds finance projects with a social connotation. For example, Icade issued a €600m social bond in 2020 to facilitate access to healthcare for all. This is a €130bn market where the share of companies is structurally low (a few billion euros of issues per year).

Since the autumn of 2020, sustainable bonds (or sustainability-linked bonds, SLBs) have experienced very strong growth driven by companies that, because of their sector of activity, do not necessarily have investments to make in the energy transition or quantifiable social objectives requiring heavy investments. In contrast to green or social bonds, which are qualified as such because of the use of funds, sustainable bonds can be used for any purpose. Their sustainability comes from the interest rate they pay to

lenders, which can be increased if they do not meet quantified ESG targets, normally ambitious ones, that they have set themselves: reducing greenhouse gas emissions, increasing recycling, switching to 100% renewable electricity, increasing the proportion of women in management teams, training disadvantaged people in energy management, etc. Ahold Delhaize's obligation is a sustainable obligation.

As with green bonds, the green premium (the greenium) increases, making this form of financing cheaper than a conventional bond, at least as long as the company is able to meet its ESG objectives. The relatively small sustainable bond market (around €70bn in 2020) will clearly continue to grow strongly in the future and could become the norm for companies.

As evidence of the growth of this market, the principles of these issues are now standardised in the Green Bonds Principles (GBP), the Social Bond Principles (SBP) and the Sustainability-Linked Bond Principles (SLBP).

Section 20.5 THE VOLATILITY OF DEBT SECURITIES

The holder of a debt security may have regarded themself as protected having chosen this type of security, but they actually face three types of risk:

interest rate risk and **coupon reinvestment risk**, which affect almost solely fixed-rate securities;

credit risk, which affects fixed-rate and variable-rate securities alike. We will consider this at greater length in the following section.

1/ CHANGES IN THE PRICE OF A FIXED-RATE BOND CAUSED BY INTEREST RATE FLUCTUATIONS

(a) Definition

What would happen if, at the end of the subscription period for the Ahold Delhaize 0.375% bond, the market interest rate rose to 0.875% (scenario 1) or fell to 0% (scenario 2)? In the first scenario, the bondholder would obviously attempt to sell the Ahold Delhaize bond to buy securities yielding 0.875%. The price of the bond would fall such that the bond offered its buyer a yield to maturity of 0.875%. Conversely, if the market rate fell to 0%, holders of the Ahold Delhaize bond would hold onto their bonds, which yield 0.375%, while the market interest rate for the same risk level is now 0%. Other investors would attempt to buy them, and the price of the bond would rise to a level at which the bond offered its buyer a yield to maturity of 0%.

An upward (or downward) change in interest rates therefore leads to a fall (or rise) in the present value of a fixed-rate bond, irrespective of the issuer's financial condition.

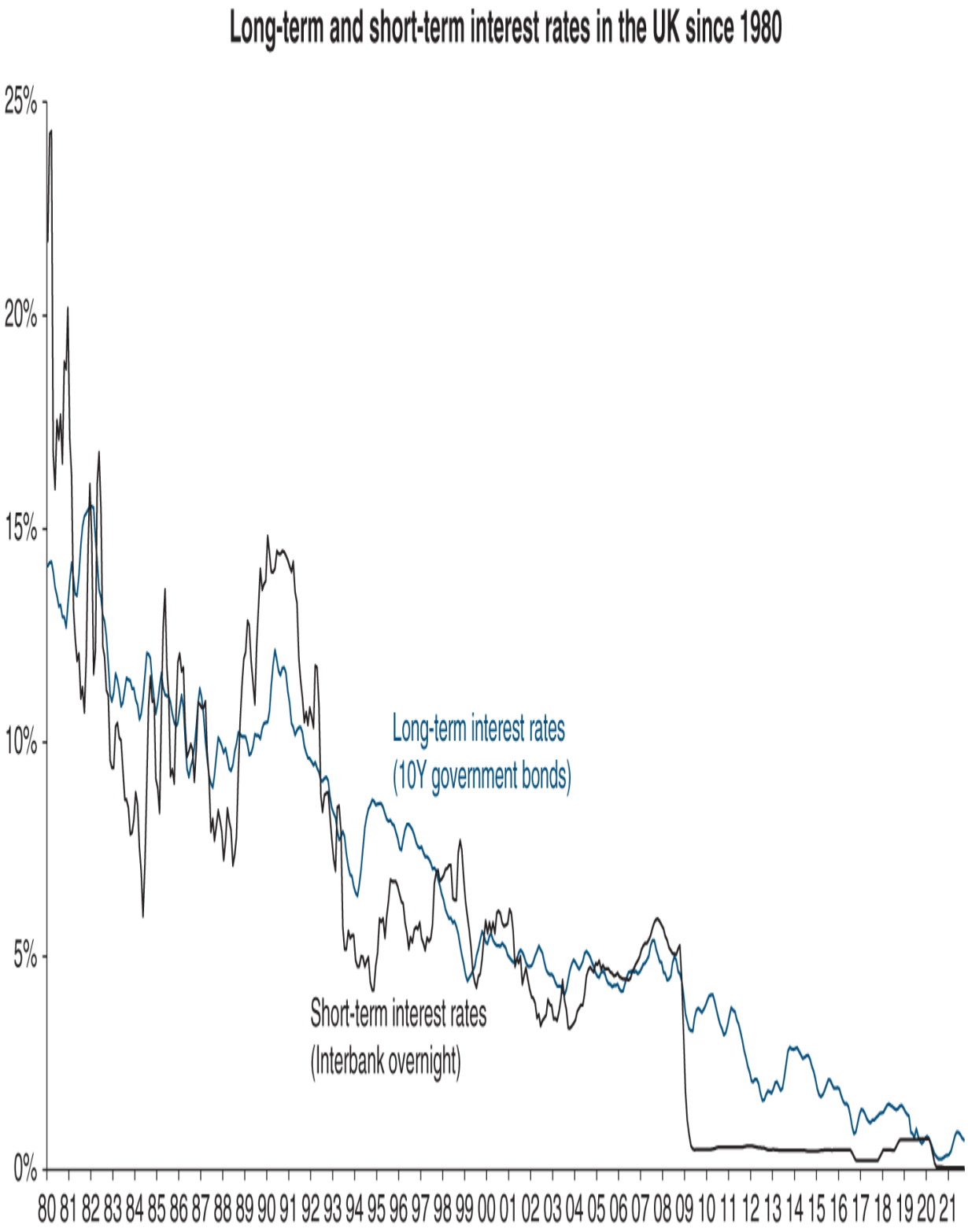
> The value of a fixed-rate debt instrument is not fixed. It varies inversely with market rates: if interest rates rise, its value declines; if interest rates fall, its value appreciates.

As we have seen, if the yield on our Ahold Delhaize bond is 0.375%, its price is 100%.

But if its yield to maturity rises to 0.875% (a 0.5 point increase or 50 basis points), its price will change to:

$$V = \sum_{i=1}^{9} \frac{0.375\%}{(1+0.875\%)^i} + \frac{100\%}{(1+0.875\%)^9} = 95.691\%$$

i.e. a decrease of 4.3%. This shows that holders of bonds face a risk to their capital, and this risk is by no means merely theoretical, given the fluctuations in interest rates over the medium term.



Source: Data from Datastream/Bank of England

(b) Measures: modified duration and convexity

The modified duration of a bond measures the percentage change in its price for a given change in interest rates. The price of a bond with a modified duration of 4 will increase by 4% when interest rates fall from 7% to 6%, while the price of another bond with a modified duration of 3 will increase by just 3%.

From a mathematical standpoint, modified duration can be defined as the absolute value of the first derivative of a bond's price with respect to interest rates, divided by the price:

$$\text{Modified duration} = \frac{1}{V} \times \sum_{t=1}^{N} \frac{t \times F_t}{(1+r)^{t+1}}$$

where r is the market rate and F_t the cash flows generated by the bond.

Turning back to the example of the Ahold Delhaize bond at its issuance date, we arrive at a modified duration of 8.83.

Modified duration is therefore a way of calculating the percentage change in the price of a bond for a given change in interest rates. It simply involves multiplying the change in interest rates by the bond's modified duration. A rise in interest rates from 0.375% to 0.875% therefore leads to a price decrease of 0.5% × 8.83 = 4.41%, i.e. from 100% to 100 × (1 − 4.41%) = 95.59%.

We note a discrepancy of 0.101% with the price calculated previously (95.691%). Modified duration is valid solely at the point where it is calculated (i.e. 0.417% here). The further we move away from this point, the more skewed it becomes. For instance, at a yield of 0.875% it is 8.79 rather than 8.83. This will skew calculation of the new price of the bond, but the distortion will be small if the fluctuation in interest rates is also limited in size. From a geometrical standpoint, the modified duration is the first derivative of price with respect to interest rates and it reflects the slope of the tangent to the price/yield curve. Since this forms part of a hyperbolic curve, the slope of the tangent is not constant and moves in line with interest rates.

(c) Parameters influencing modified duration

Let's consider the following three bonds:

Bond	A	B	C
Coupon	5%	5%	0%
Price	100	100	100
Yield to maturity	5%	5%	5%
Redemption price	100	100	432.2
Residual life	5 years	15 years	30 years

How much are these bonds worth in the event of interest rate fluctuations?

Market interest rates (%)	A	B	C
1	119.4	155.5	320.7
5	100	100	100
10	81.0	62.0	24.8
15	66.5	41.5	6.5

Note that the **longer the maturity of a bond, the greater its sensitivity to a change in interest rates**.

Modified duration is primarily a function of the maturity date. **The closer a bond gets to its maturity date, the closer its price moves towards its redemption value and the more its sensitivity to interest rates decreases.** Conversely, the longer it is until the bond matures, the greater its sensitivity to interest rate fluctuations.

Modified duration also depends on two other parameters, which are nonetheless of secondary importance to the time-to-maturity factor:

the bond's coupon rate: the lower the coupon rate, the higher its modified duration;

market rates: the lower the level of market rates, the higher a bond's modified duration.

Modified duration represents an investment tool used systematically by fixed-income portfolio managers. If they anticipate a decline in interest rates, they opt for bonds with a higher modified duration, i.e. a longer time

to maturity and a very low coupon rate, or even zero-coupon bonds, to maximise their capital gains.

Conversely, if portfolio managers expect a rise in interest rates, they focus on bonds with a low modified duration (i.e. due to mature shortly and carrying a high coupon) in order to minimise their capital losses.

Convexity is the second derivative of price with respect to interest rates. **It measures the relative change in a bond's modified duration for a small fluctuation in interest rates.** Convexity expresses the speed of appreciation or the sluggishness of depreciation in the price of the bond if interest rates decline or rise.

2/ COUPON REINVESTMENT RISK

As we have seen, the holder of a bond does not know at what rate its coupons will be reinvested throughout the bond's lifetime. Only zero-coupon bonds afford protection against this risk, simply because they do not carry any coupons!

First of all, note that this risk factor is the mirror image of the previous one. If interest rates rise, then the investor suffers a capital loss but is able to reinvest coupon payments at a higher rate than the initial yield to maturity. Conversely, a fall in interest rates leads to a loss on the reinvestment of coupons and to a capital gain.

Intuitively, it seems clear that for any fixed-income debt portfolio or security, there is a period over which:

the loss on the reinvestment of coupons will be offset by the capital gain on the sale of the bond if interest rates decline;

the gain on the reinvestment of coupons will be offset by the capital loss on the sale of the bond if interest rates rise.

All in all, once this period ends, the overall value of the portfolio (i.e. bonds plus reinvested coupons) is the same, and the investors will have achieved a return on investment identical to the yield to maturity indicated when the bond was issued.

In such circumstances, the portfolio is said to be **immunised**, i.e. it is protected against the risk of fluctuations in interest rates (capital risk and

coupon reinvestment risk). This time period is known as the **duration** of a bond. It may be calculated at any time, either at issue or throughout the whole life of the bond.

For instance, an investor who wants to be assured of achieving a certain return on investment over a period of three years will choose a portfolio of debt securities with a duration of three years.

Note that the duration of a zero-coupon bond is equal to its remaining life.

In mathematical terms, duration is calculated as follows:

$$\text{Duration} = \frac{\sum_{t=1}^{N} \frac{t \times F_t}{(1+r)^t}}{\sum_{t=1}^{N} \frac{F_t}{(1+r)^t}}$$

Duration can be regarded as being akin to the discounted average life of all the cash flows of a bond (i.e. interest and capital). The numerator comprises the discounted cash flows weighted by the number of years to maturity, while the denominator reflects the present value of the debt.

The Ahold Delhaize bond has a duration of 8.86 years at issue.

Duration is linked to modified duration by a very simple equation, since:

$$\text{Duration} = (1 + r) \times \text{Modified duration}$$

We can see that 8.83 × (1 + 0.417%) = 8.86 years.

Turning our attention back to modified duration, we can say that it is explained by the duration of a bond, which brings together in a single concept the various determinants of modified duration, i.e. time to maturity, coupon rate and market rates.

Section 20.6 DEFAULT RISK AND THE ROLE OF RATING

Default risk can be measured on the basis of a traditional financial analysis of the borrower's situation or by using credit scoring, as we saw in Chapter 8. Specialised agencies, which analyse the risk of default, issue ratings that reflect the quality of the borrower's signature. There are three agencies that dominate the market – Standard & Poor's, Moody's and Fitch – but with the rise of a debt capital market for mid-sized companies, new rating agencies have emerged (e.g. Spread Research, Scope Credit Rating, or Egan-Jones).

Rating agencies provide ratings for companies, banks, sovereign states and municipalities. They can decide to rate a specific issue or to give an absolute rating for the issuer (rating given to first-ranking debt). Rating agencies also distinguish between short- and long-term prospects.

Some examples of short-term debt ratings:

Moody's	Standard & Poor's and Fitch	Definition	Examples (May 2021)
Prime 1	A–1	Superior ability to meet obligations	Sanofi, Nestlé, France
Prime 2	A–2	Strong ability to repay obligations	Iberdrola, Deutsche Bank
Prime 3	A–3	Acceptable ability to repay obligations	Morocco, ArcelorMittal
Not Prime	B	Speculative	Senegal, Lufthansa
	C	Vulnerable	Argentina
	D	Insolvent	Venezuela, Lebanon

Some examples of long-term debt ratings:

Moody's	Standard & Poor's and Fitch	Definition	Examples (May 2021)

Moody's	Standard & Poor's and Fitch	Definition	Examples (May 2021)
Aaa	AAA	Best quality, lowest risk	Germany, Australia Johnson & Johnson, Microsoft
Aa	AA	High quality. Very strong ability to meet payment obligations	Nestlé, Sanofi, Apple, France
A	A	Upper-medium grade. Issuer has strong capacity to meet its obligations	BASF, BNP Paribas, LVMH, Unilever
Baa	BBB	Medium grade. Issuer has satisfactory capacity to meet its obligations	Morocco, Italy, Telefónica, Pernod Ricard
Ba	BB	Speculative. Uncertainty of issuer's capacity to meet its obligations	Renault, Attijariwafa Bank, Vietnam
B	B	Issuer has poor capacity to meet its obligations	Casino, Pakistan
Caa	CCC	Poor standing. Danger with respect to payment of interest and return of principal	CGG, Democratic Republic of Congo
Ca	CC	Highly speculative. Often in default	Belize
C	C	Close to insolvency	
	D or SD	Insolvent!	Vallourec, Lebanon

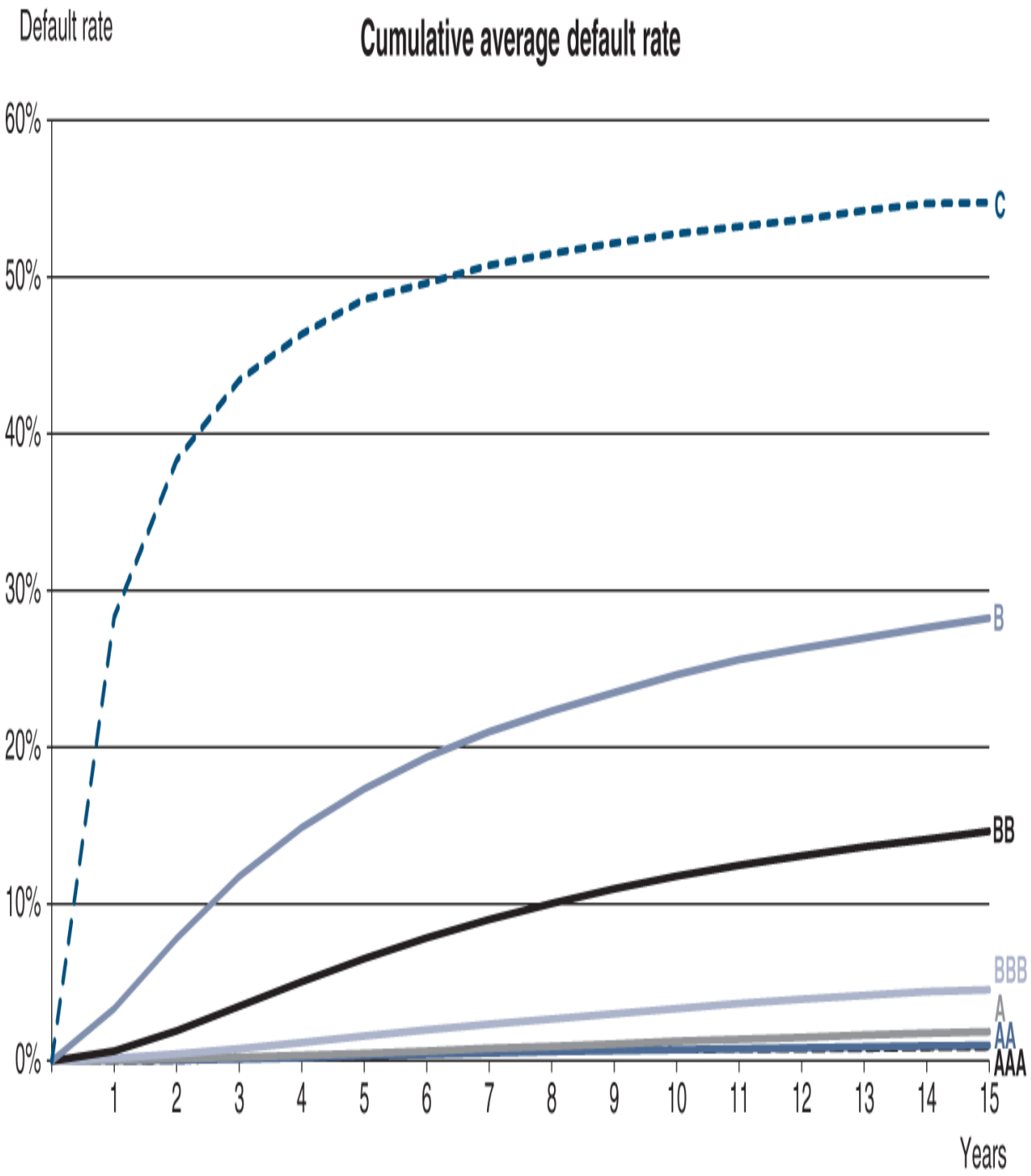
Rating services also add an **outlook** to the rating they give – stable, positive or negative – which indicates the likely trend of the rating over the two to three years ahead.

Short- and medium-term ratings may be modified by a + or − or a numerical modifier, which indicates the position of the company within its generic rating category. This is referred to as a *notch*, such as between AA–

and A+. The **watchlist** alerts investors that an event such as an acquisition, disposal or merger, once it has been weighed into the analysis, is likely to lead to a change in the rating. A company on the watchlist is likely to be upgraded when the expected outcome is positive, downgraded when the expected outcome is negative and, when the agency is unable to determine the outcome, it indicates an unknown change.

The term *split rating* is used when several rating agencies evaluate the same company and do not give equivalent ratings (Ba+ and BBB– for example).

Ratings between AAA and BBB− are referred to as **investment grade**, and those between BB+ and D as **speculative grade** (or **non-investment grade**). The distinction between these two types of risk is important to investors, especially institutional investors, who often are not permitted to buy the risky speculative grade bonds!



A sample of the international ratings provided by Standard & Poor's reveals that after 15 years, 0.84% of AAA issuers defaulted on a repayment deadline, while 27.6% of B issuers and 54.7% of CCC, CC, and C issuers defaulted

Source: Data from Standard & Poor's 2020

Bonds at the edge of the investment grade frontier, rated BB+/BB are called crossover bonds. This is an intermediate category that links the investment grade and non-investment grade categories. Depending on the state of the market, the definition of cross-over can vary and even include companies rated BB– in well-oriented markets.

In Europe, rating agencies generally rate companies at their request, which enables them to access privileged information (medium-term plans, contacts with management). Rating agencies very rarely rate companies without management cooperation. When they do, the accuracy of the rating depends on the quality of the information about the company available on the market. If the company does not require a public rating immediately (or if it does not like the rating allocated!), it may request that it be kept **confidential**, and it is then referred to as a *shadow rating*. The cost for a firm to get a first rating is quite high (over €500,000 on average, to which should be added an annual cost of over €100,000).

The rating process, which can take up to three months, differs from the scoring process as it is not only a quantitative analysis. The agency will also take into account:

the size of the company

the positioning of the company in its sector;

the analysis of the financial data;

the current capital structure but also the financing strategy.

Most rating agencies have developed teams capable of assessing the ESG aspects of an issuer or bond, or even acquired specialised agencies such as Vigeo Eiris acquired by Moody's.

SUMMARY

The summary of this chapter can be downloaded from www.vernimmen.com.

A debt security is a financial instrument representing the borrower's obligation to the lender from whom they have received funds. This obligation provides for a schedule of financial flows defining the terms of repayment of the funds and the lender's remuneration in the interval.

The price of a bond does not reflect its actual cost. The yield to maturity (which cancels out the bond's NPV – that is the difference between the issue price and the present value of future flows) is the only criterion allowing investors to evaluate the various investment opportunities (according to risk and length of investment). On the secondary market, the yield to maturity is merely an opportunity cost for the issuer, i.e. the cost of re-funding today.

The basic parameters for bonds are as follows:

Nominal or face value.

Issue price, with a possible premium on the nominal value.

Redemption: redemption at maturity (known as a bullet repayment), constant amortisation or fixed instalments. The terms of the issue may also include provisions for early redemption (call options) or retraction (put options).

Average life of bond: the average life of the bond corresponds to the average of each of the repayment periods in instances where the bond is repaid in multiple instalments.

Nominal rate: also known as the coupon rate and used to calculate interest payable.

Issue/redemption premium/discount: the difference between the issue premium/discount and the nominal value and the difference between the redemption premium/discount and the nominal value.

Periodic coupon payments: frequency at which coupon payments are made. We talk of zero-coupon bonds when total compounded interest earned is paid only upon redemption.

The diversity of these parameters explains why the yield to maturity may differ from the coupon rate.

Fixed-rate debt securities are exposed to the risk of interest rate fluctuations: the value of a fixed-rate debt security increases when interest rates fall, and vice versa. This fluctuation is measured by:

the modified duration, which measures the percentage change in the price of a bond for a small change in interest rates. Modified duration is a function of the maturity date, the nominal rate and the market rate;

convexity, the second derivative of price with respect to interest rates, which expresses the speed of appreciation or the sluggishness of depreciation in the price of the bond if interest rates decline or rise;

coupon reinvestment risk. There is a time period over which the portfolio is said to be immunised, i.e. it is protected against the risk of fluctuations in interest rates (capital risk and coupon reinvestment risk). This period is known as the duration of the bond, and is equal to the ratio of the discounted cash flows weighted by the number of years to maturity and the present value of the debt.

Floating-rate securities have a coupon that is not fixed but indexed to an observable market rate (with a fixed margin that is added to the variable rate when the coupon is calculated). Variable-rate bonds are not very volatile securities, even though their value is not always exactly 100% of the nominal.

All debt securities are exposed to default risk, which is assessed by rating agencies on the basis of ratings (AAA, AA, A, BBB, etc.) that depend on credit quality of the issuer. The result is a *spread*, which is the difference between the bond's yield to maturity and that of a no-risk loan over an identical period. Obviously, the better the perceived solvency of the issuer, the lower the spread.

QUESTIONS

1/What is face value? What is it used for?

2/What is the difference between the average life and the duration of a bond? For what type of bond are the two equal?

3/What is the yield to maturity of a bond? How is it computed?

4/Is a bond more volatile on the day of issue or on the day of redemption?

5/Is the value of a floating-rate bond always equal to 100%? Why?

6/You are an investor anticipating a decrease in interest rates. Classify, by decreasing order of preference, these bonds:

floating-rate bond to be redeemed (bullet) in 10 years;

floating-rate bond to be redeemed (bullet) in seven years;

perpetuity with fixed rate;

fixed-rate bond to be redeemed (bullet) in five years;

floating-rate bond with constant instalments with five-year maturity;

floating-rate bond with constant amortisation with five-year maturity.

7/Was the yield to maturity of the Ahold Delhaize's bond higher or lower than the nominal rate at issue? Why?

8/True or false:

if interest rates increase, the price of fixed-rate bonds will fall;

if the nominal rate is higher than the yield to maturity, the bond will trade at less than 100% of face value;

a bond with a high coupon will be worth more than a bond with a low coupon;

the higher the duration, the higher the value of a bond.

9/Does the investor's required rate of return for a bond increase with:

inflation;

the proportion of debt in the financial structure of the corporate;

the maturity;

government bond rates;

the risk of the assets?

10/The spread between a corporate bond yield to maturity and the government bond rate to maturity corresponds to an option. What are its features?

11/True or false:

the higher the duration, the lower the modified duration;

the longer the maturity, the higher the modified duration;

the higher the coupon, the higher the duration.

12/In what situation can a floating-rate bond trade at much less than 100%?

You'll find more questions at www.vernimmen.com.

EXERCISES

1/Butchery Withoutbones issued the following bond:

Amount: €125m

Issue price: 99.731%

Date of issue: 20 February 2021

Settlement date: 20 February 2021

Maturity: 7 years

Annual coupon: 5.5%, i.e. in one instalment on 20 February of each year, with the first payment on 20 February 2022.

Normal redemption date: The bonds will be redeemed in full on 20 February 2028 at par value.

Calculate the yield to maturity of the bond on issue, its modified duration and its duration.

On 21 February 2022, the yield to maturity on bonds comparable to the Butchery Withoutbones bond is 5%. Calculate the value, the modified duration and the duration on this date of the Butchery Withoutbones bond. What are your comments compared to previous results?

2/In August 2021, Mineral Waters from Syldavia launched a two-tranche bond of the same size:

	Tranche A	**Tranche B**
Redemption	at maturity in 10 years	at maturity in 10 years
Interest rate	8% + 1.5 × (ABY − 8.3%)	8% − 1.5 × (ABY − 8.3%)
Interest rate floor/ceiling	0%/16%	0%/16%

ABY = average bond yield on the Syldavian bond market.

On the launch date of the bond, the ABY was 8.3%.

Analyse the behaviour of these two bonds for different ABYs.

If you thought that interest rates were going to rise, which tranche would you choose?

Did Mineral Waters from Syldavia borrow at a fixed or a variable rate? What were they expecting interest rates to do?

What advantages did this bond have for Mineral Waters from Syldavia?

3/On 21 February 2021, you see the following figures in Les échos de Moulinsart for Belgian government zero-coupon bonds (which only pay a single coupon with the principal on maturity of a total amount of 100):

Maturity	Price
20 February 2022	96.25
20 February 2023	91.92
20 February 2024	87.38
20 February 2025	82.90
20 February 2026	78.35
20 February 2027	74.20
20 February 2028	70.13

Calculate the yield to maturity for each zero-coupon bond.

You estimate that the Butchery Withoutbones risk requires a spread of 58 basis points (0.58%) compared with government bonds. Calculate the value of the Butchery Withoutbones bond from Exercise 1.

ANSWERS

Questions

1/*It is the nominal value, it is used to compute the coupon and the amount that will be repaid.*

2/*Duration is kind of a discounted average life (including coupons). Zero coupon.*

3/*The rate that will make the net present value of future cash flows (coupons, repayment) equal to the present price of the bond.*

4/*On the day of issue. On the day of redemption it will invariably be worth its redemption price.*

5/*No because of interests that accrue with time.*

6/*(c), (d), (e), (f), (a) and (b) being equal.*

7/*The same; as the issue price is equal to the face value, the bond will be repaid at par and interests are computed starting the same day as the subscription day.*

8/*True (a); false (b), (c), (d).*

9/*Yes (a), (b), (c) (generally), (d), (e).*

10/*It is the value of a put allowing the shareholders to sell the assets of the firm to the lenders if at maturity the value of assets is below the redemption price of the debts.*

11/*True (b); false (a), (c).*

12/*If the solvency of the issuer has deteriorated.*

Exercises

A detailed Excel version of the solutions is available at www.vernimmen.com.

1/

Yield to maturity = 5.547%; modified duration = 5.68; duration = 6.0 years.

The modified duration and the duration are reduced since the life of the bond is shorter, even though the market rate has dropped, which shows that the life factor impacts more on modified duration than the market rate factor. Value = 102.6, modified duration = 5.3, duration = 5.28 years.

2/

The tranche A bond prices rise when the interest rate rises. The opposite happens for tranche B.

Tranche A.

A fixed rate of 8%, rise.

To be able to issue at a lower rate than the market rate (8% vs. 8.3%).

3/

3.90%; 4.30%; 4.60%; 4.80%; 5%; 5.10%; 5.20%.

V = 98.79.

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NOTES

1 *More precisely at mid-swap, i.e. halfway between lending and borrowing rates.*

2 *In some cases the first coupon payment is different while the issue price is identical: the bonds only become fungible after the first coupon payment.*

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Chapter 21
OTHER DEBT PRODUCTS

What a choice!

In the previous chapter, we first presented the bond as a debt product and we illustrated the key features of a debt product through this simple security. The reader will now discover that there are actually a very large number of products that follow the same logic as that of a bond: remuneration independent from the financial performance of the firm, a commitment to reimburse, and in the event of insolvency: priority over equity in the reimbursement of the money owed.

Whether short, medium or long term, market or bank, these instruments increasingly have an ESG dimension either through the use of proceeds or through an interest rate whose level depends on the achievement of environmental, social or governance objectives, such as the sustainable bonds presented in the previous chapter. These are known as green loans and impact loans.

Section 21.1 MARKETABLE DEBT SECURITIES

1/ SHORT-TERM MARKETABLE SECURITIES

The term bond (see previous chapter) is used to refer to marketable securities with maturity of over one year, but firms can also issue shorter-term instruments. **Commercial paper** refers to negotiable debt securities issued on the money market by large (and now medium-sized) companies for periods ranging from one day to one year. In practice, the average maturity of commercial paper is very short, between one and three months. Issuers can also launch paper denominated in foreign currency.

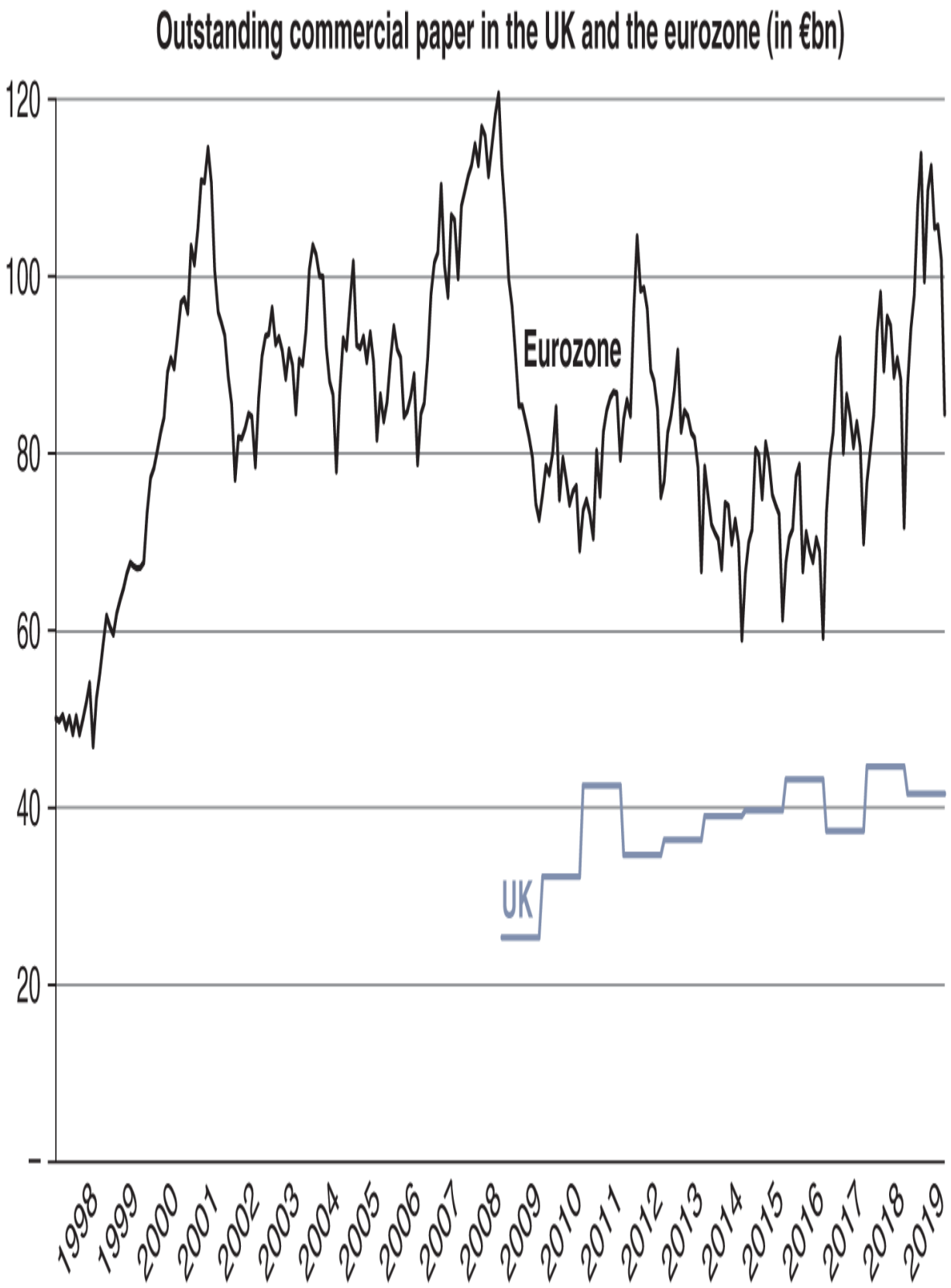
Short-term European paper (STEP) has homogenised the documentation for the issue of short-term paper in Europe.

> Commercial paper enables companies to borrow directly from investors or other companies without going through the banking system and at rates very close to those of the money market.

Obtaining at least a short-term credit rating for a commercial paper issue is optional but implicitly recommended, since companies are required to indicate whether they have called on a specialised rating agency and, if so, must disclose the rating given. Moreover, any issuer can ask a bank for a commitment to provide financing should the market situation make it impossible to issue new notes once the current notes reach maturity. These backup lines came into their own in March 2020 when the Covid-19 crisis struck, as the commercial paper market virtually closed for a few weeks (before ECB provided liquidity by subscribing directly corporate commercial paper). Companies have to have such lines if they want their commercial paper issues to get an investment grade rating. Certain credit rating agencies, for example, will only keep their short-term rating of outstanding commercial paper at A1+ if 70% of the paper is covered by a backup line.

In addition to costing less than an overdraft, commercial paper gives the company some autonomy vis-à-vis its bankers. It is very flexible in terms of

maturity and rates, but less so in terms of issue amounts.



Source: Data from ECB

Regardless of their country of origin, companies can issue US commercial paper. Such issues are governed by Regulation 144A defining the terms and conditions of securities issues by foreign companies in the US (see Chapter 25).

2/ LONG-TERM MARKETABLE SECURITIES

These include two types. The first is bonds, which we have seen in the previous chapter; they are listed and potentially subscribed to by international investors. The second usually takes the form of bonds (listed or not) that are subscribed to through a **private placement**[1] by a limited number of institutional investors (insurers, asset managers, pension funds) of a specific country.

There is a market for such products in the US, where there is a specific regulation for such issues, but also in Germany (***Schuldschein***), France (**Euro PP**) and in Belgium (mostly to individual investors).

Private placements have become a real alternative for the financing of large (ArcelorMittal, BASF, Rolls-Royce) or mid-sized (Vilmorin, Copenhagen Airport) or even smaller (Touax) groups. The transaction usually consists in the issue of a bond (sometimes a loan) in dollars or euros with a fixed rate. These financings generally have a long maturity (7 to 15 years, with the bulk of the issue with a 6- to 7-year maturity). Most investors keep their investment until maturity (buy and hold). As there is no liquidity constraint, the issues (or each tranche within an issue) can therefore be of reduced size (compared to a standard bond issue).

Private placements are appealing for groups that are willing to diversify their financing sources and have access to long-term financing without the need for a rating. The documentation can include some stringent covenants, and investors in such products may show much less flexibility than banks when it comes to renegotiation.

The increasing constraints on bank solvency have led to reduced loan offerings, in particular outside the domestic market. Financings outside the banking circuit have therefore developed (shadow banking), and the increasing success of private placements is just an illustration thereof.

Section 21.2 BANK DEBT PRODUCTS

Banks have developed a number of credit products that, contrary to market financing, are tailored to meet the specific needs of their clients.

Business loans (i.e. loans not linked to a specific asset, which we will see in the next section) have two key characteristics: they are based on interest rates and take into account the overall risk of the company.

The credit line will either be negotiated with a single bank, in which case the term **bilateral** loan is used, or with a number of banks (usually for larger amounts) and the firm will then put in place a club deal or a **syndicated loan**.

For companies, these loans are often a backup mechanism to meet any kind of cash payment.

Business loans are based on interest rates – in other words, cost, and the cheapest loan on offer usually wins the company's business. They rarely come with ancillary services such as debt recovery, and are determined according to the maturity schedule and margin on the market rate.

These loans take into account **corporate risk**. The bank lending the funds agrees to take on the company's overall risk as reflected in its financial health. A profitable company will always obtain financing as long as it adopts a sufficiently prudent capital structure. In fact, the financial loan is guaranteed by the corporate manager's explicit compliance with a certain number of criteria, such as ratios, etc. If the loan is accompanied by a pricing or rating grid, the interest rate margin charged changes during the course of the credit in line with changes in the economic and financial situation of the company as measured by ratios or its rating. If it improves, the credit margin will fall; if it deteriorates, it will rise.

Financial brokers have started to develop their activities between SMEs and commercial banks by acting as intermediaries.

1/ TYPES OF BUSINESS LOANS

Overdrafts on current accounts are the corporate treasurer's means of adjusting to temporary cash shortages but, given their high interest charges, they should not be used too frequently or for too long. Small enterprises can

only obtain overdrafts against collateral, making the overdraft more of a secured loan.

Commercial loans are short-term loans that are easy to set up and therefore very popular.

The bank provides the funds for the period specified by the two parties. The interest rate is the bank's refinancing rate plus a margin negotiated between the two parties. It generally ranges from 0.10% to 1.50% per year depending on the borrower's creditworthiness, since there are no other guarantees.

Commercial loans can be made in foreign currencies either because the company needs foreign currencies or because the lending rates are more attractive.

Bridge loans are loans set up in anticipation of future revenues that will ensure their repayment: capital increase, bond issue, sale of a subsidiary, etc. Necessarily short-term, and often used for large amounts, it has evolved in parallel with financial transactions, particularly mergers and acquisitions. Its margin increases sharply over time (step ups) to encourage the borrower to refinance or dispose of planned assets.

Alternatively, the firm can put in place a **revolving credit facility** (RCF), which is a confirmed short-term or mid-term credit line. When the line is put in place, the firm will not have debt on its balance sheet, but it will have the capacity to draw on the credit line when it needs it. On the undrawn amount, the corporate will only pay a commitment fee. In addition to the spread, a utilisation fee will be added depending on the percentage of credit drawn.

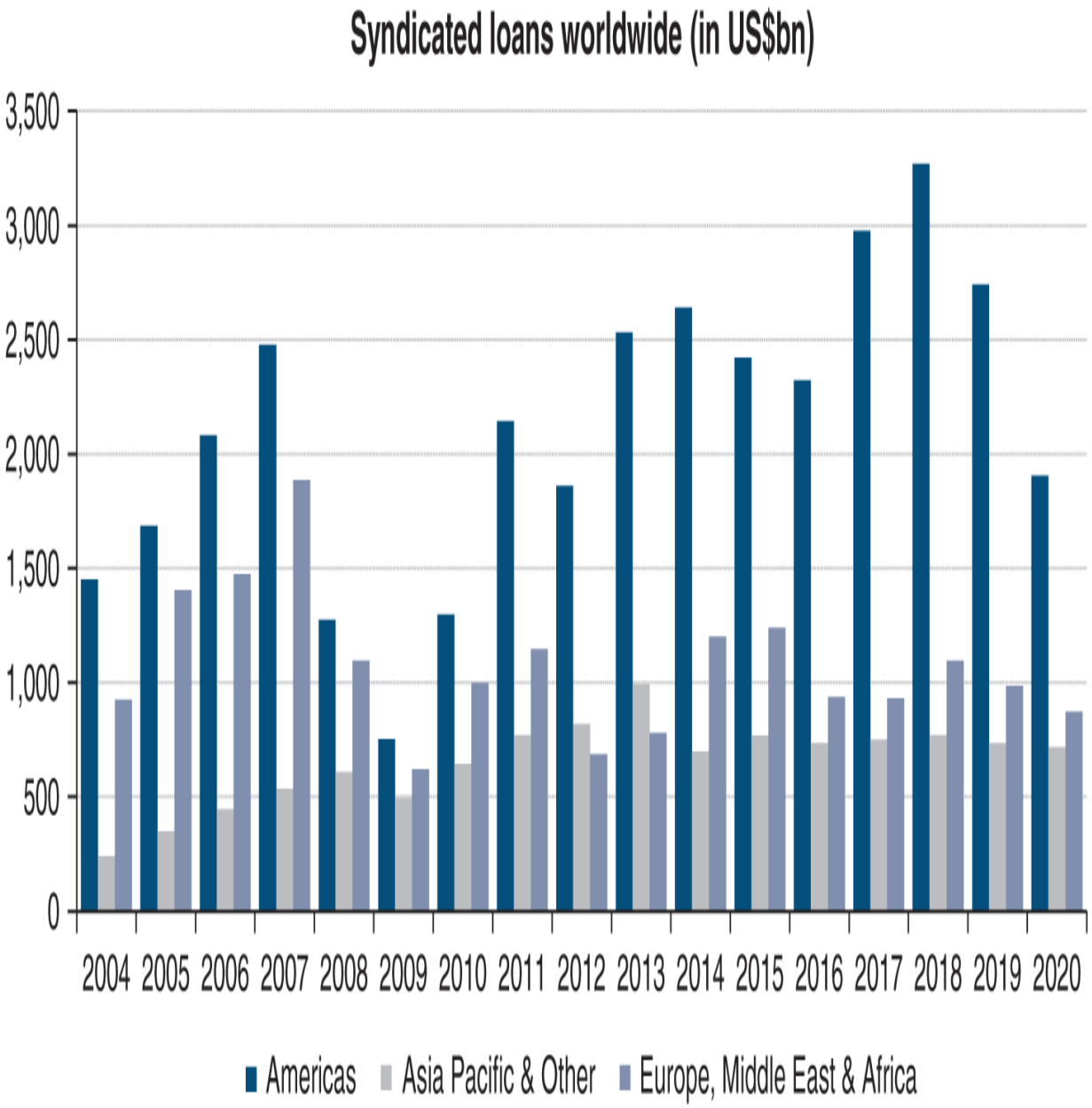
If the firm has to finance a specific investment, it will put in place a **term loan** that will be less flexible than the RCF. Usually the borrower has the capacity to reimburse by anticipation, but will not be allowed to re-borrow any of the repaid amounts.

Note that loans can be extended to subsidiaries which can then borrow under the terms of the contract.

Syndicated loans are typically set up for facilities exceeding €50m which a single bank does not want to take on alone. The lead bank (or banks, depending on the amounts involved), known as the **mandated lead**

arranger, will arrange the line and commit to undertake the full amount of the credit. It will then syndicate part of the loan to 5–20 banks, which will each lend part of the amount. The mandated lead arranger (known as the documentation agent) will receive an arrangement (or coordination) and underwriting fee and the other banks a lower participation fee (or flat fee).

Firm underwriting by one firm will allow the company to maintain maximum confidentiality with regard to the transaction, which could be crucial, for example in the case of the acquisition of a listed company. This can be achieved by having only one arranging bank that will bear the whole credit risk until the transaction becomes public (it can then syndicate the loan).



Source: Data from Thomson

When the loan is put in place with the house banks of the firm with no further syndication of the loan, we use the term **club deal**.

Much like the bond market, products promoting the environmental or societal virtues of the underlying company are emerging on the bank debt market. These are called **impact loans**. Certain large companies (Danone, Bel, Philips, etc.) have set up **green RCFs** (green loans) whose margin depends (marginally) on compliance with environmental objectives or criteria. Whilst the current financial impact for the company is marginal,

this could change in an economic context of low liquidity markets, leading lenders to favour virtuous behaviour. In the short term, the corporate impact internally is predominantly psychological, but not necessarily negligible. Whereas €40bn had been lent in 2018, it was over €100bn in 2020.

2/ FEATURES OF THE LOAN DOCUMENTATION

The loan documentation sets out:

the amount, maturity and purpose of the loan (i.e. the use of funds);

the way the amount will be cashed in by the firm (one single payment, upon request by the firm, etc.), and minimum drawdown amounts;

the interest rate, fixed or more often floating, periodicity of interest payments, rules for the computation of interest, fees to be paid;

the reimbursement or amortisation profile;

the potential early repayment options;

the early termination events (change of control, …)

the potential guarantees (by other group companies), pledges;

Banks include a certain number of **covenants** in the loan agreements, chiefly regarding accounting ratios, financial decisions and share ownership, which we will look at in detail in Section 39.2.

Two clauses are generally unavoidable:

Pari passu clauses are covenants whereby the borrower agrees that the lender will benefit from any additional guarantees it may give on future credits.

Cross default clauses specify that if the company defaults on another loan, the loan which has a cross default clause will become payable even if there is no breach of covenant or default of payment on this loan.

The agreement can also include a clause allowing banks to cancel the contract in the event of a material adverse change (MAC). The execution of such clauses (as well as “market disruption” clauses) is very complex from a legal point of view, but also from a commercial point of view.

Standardised legal documentation for syndicated loans has developed in Europe, led by the Loan Market Association (LMA) in London.

There exists a clear cyclicality on the loan market. After a period of high liquidity (2004–2007) marked by very favourable borrowing terms (both in terms of legal documentation and spreads), banks drastically tightened the terms and conditions of their loans after 2008 due to the weakening of their loan portfolios and the reduced market liquidity. Since 2013, lending conditions have become increasingly borrower-friendly and quite light.

Section 21.3 ASSET-BASED FINANCING

Unlike the previous financing tools which expose the lender to the company, the following financing tools only expose the lender to one of the company's assets.

1/ FACTORING

Factoring is a credit transaction whereby a company holding an outstanding trade bill sells it to its bank or a specialised financial institution in exchange for the payment of the bill, less interest and commissions. **Factoring companies or factors** specialise in buying a given portion of a company's trade receivables at a discount to the face value. The factoring company then collects the invoice payment directly from the debtors.

Factoring actually may include one or several of the following services to the firm:

financing at an attractive interest rate;

externalisation of receivables recovery;

insurance against unpaid bills;

off-balance-sheet financing.

Factoring is like discounting with additional services!

Banks increasingly offer non-recourse discounting services, which consist of an outright purchase of the trade receivables without recourse in the event of default. This technique removes contingent liabilities from the bank's on- and off-balance-sheet accounts.

A factoring contract mentions:

The scope of the contract (nature of the product, geography, type of debtors).

The share of invoices available for financing (typically the bank will retain 8% to 15% of the invoices to cover the risk of unpaid invoices or litigation).

The cap on financing and its features.

The financing fee charged for the early availability of funds and that evolves in line with a money market index (EONIA, €ster of 3-month Euribor in Europe) plus a spread of up to 2.5%.

The factoring fee that pays for the services and guarantee provided by the factor; this is computed as a percentage of invoices sold (between 0.2% and 2%). Its level depends on certain factors such as the nature and risk of clients, the statistics of unpaid invoices, the geographical spread of invoices, the average DSO (days sales outstanding), the number of customers and invoices and the average amount of invoices.

Whether the contract allows for possible recourse to the company or not (if so, the firm will have a debt towards the factor after a pre-agreed period).

Large groups sometimes suggest that their suppliers put in place a reverse factoring line, whereby the supplier will get early payment of the invoice through a bank. The logic is the same as factoring, except that it is provided by the client. It is often used by clients in order to force lengthier payment terms (to the extent permitted by the applicable jurisdictions).

2/ DISCOUNTING

There are several short-term financing techniques that bridge the cash flow gap between invoicing and collection and are backed by the corresponding trade receivable. They are the counterpart to trade credit (inter-company credit), which is widely used in some countries (Continental Europe).

Discounting is a financing transaction whereby a company remits an unexpired commercial bill of exchange to the bank in return for an advance of the amount of the bill, less interest and fees.

The discounting bank becomes the owner of the bill and, ordinarily, is repaid when it presents the bill to its customer's customer for payment. If, at maturity, the bill remains unpaid, then the bank turns to the company and asks them to pay. The company assumes the bankruptcy risk of its customer (such discounting is called discounting with recourse).

In principle, a company uses discounting to obtain financing based on the credit it extends to its own customers, which may be better known to the banking system than the company is. In this way, the company may be able to obtain better financing rates.

In discounting, the bank does not finance the company itself, but only certain receivables in its portfolio, i.e. the bills of exchange. For the bank, the risk is bound by a double guarantee: the credit quality of its customer backed by that of the issuer of the bill of exchange.

Under most accounting principles (including IFRS and US GAAP), discounted bills are reintegrated into accounts receivable and the bank advances are reported as debt.

For this reason, banks now also offer non-recourse discounting, which is a straight sale of customer receivables, under which the bank has no recourse to its customer if the bill remains unpaid at maturity. This technique allows the company to remove the receivables from its balance sheet and from its off-balance-sheet commitments and contingencies.

3/ INVENTORY FINANCING

Inventory financing is a form of pawn financing in which the firm retains ownership of inventory in which the lender has rights only in the event of the firm's default.

All inventories are potentially concerned, except for those subject to retention of title and perishable inventories. The lender may request that the inventories securing its loan be physically transferred to the warehouses of a third party pledgor or isolated in a dedicated area (retention-of-title financing). Otherwise, they remain in the company. The financing is generally half of the net book value of the inventories concerned, bearing in mind that part of the company's inventory is not concerned so as not to hinder its daily operations and logistics.

It is a preferred method of financing for financially weak companies to whom lenders would refuse to lend without this security.

Very old in certain sectors (agri-food, where it takes the form of a promissory note authorised by the company), inventory financing has a lower cost than an overdraft because it is well collaterised. However, it is cumbersome in terms of administrative procedures (contracts covering the financing, the pledges with a specialist collateral taker, audits, control and monitoring of the stock). The financing expires with the sale of the inventory and its exit is often through a discounting or factoring of the

receivables from the buyers of the inventory. It is therefore a form of short-term financing with some exceptions (wine sector).

4/ FINANCIAL LEASES

While banks rarely offer long-term loans (more than five years) on the basis of a company's intrinsic qualities alone, this is not the case for loans backed by a separate guarantee of the company's assets through a suitable legal structure. Such an asset considerably limits the risk of insolvency and makes it possible to fix the price of the credit for a long period. Financial leasing enhances the value of the collateral provided by the borrower and is structured around this collateral.

Leasing is a contract for the lease of an asset over a fixed period of time between a company (industrial or commercial) and a bank or specialised institution that owns the asset, with a promise to sell (option to buy) the asset to the lessee at the end of the contract.

The interest of leasing for the “lender” is to have a loan secured by an asset legally distinct from the company's assets. This technique can also be used in complex arrangements to play on the tax variable.

A company can thus use part of its operating fixed assets (land, buildings and other fixed assets) in a leasing system enabling it, if necessary, to buy back the asset at maturity for a contractually fixed value.

Two main types of leasing can be distinguished:

equipment leasing concerns capital goods, machinery and tools. The company generally chooses its equipment from the supplier. It then goes to a leasing company which buys the goods from the supplier instead of the firm and leases them to the latter under an irrevocable commitment over a specified period. At the end of this period, the company has the option of renouncing the lease, renewing the contract, or acquiring the equipment for a price that takes into account the payments made during the lease period;

real estate leasing concerns operations whereby a company leases real estate for professional use (offices, factories, hangars, etc.) owned by a leasing company with the possibility of becoming the owner of all or part of the leased property, at the latest at the end of the lease. Linked to the depreciation period of the leased asset, the duration of the real estate leasing contract is generally between 10 and 20 years.

The lessor and the lessee are bound by an agreement that sets out the conditions under which one of the parties may terminate its commitment.

While in the company's financial statements leasing is often off-balance sheet since the company is not the legal owner of the asset, in the consolidated financial statements the economic reality prevails over the legal analysis. In the vast majority of cases, the asset is on the balance sheet and a corresponding debt is shown as a financial liability.

Finally, let us mention the long-term financial lease without purchase option (**operating lease**), which is widely used in certain sectors (IT, transport, etc.). This is a real lease of the property without the company having the option to acquire it after a certain period of use.[2] This has nothing to do with leasing, where the initial intention of the borrower is ultimately to be able to acquire the asset financed in this way.

5/ SALE AND LEASE BACK

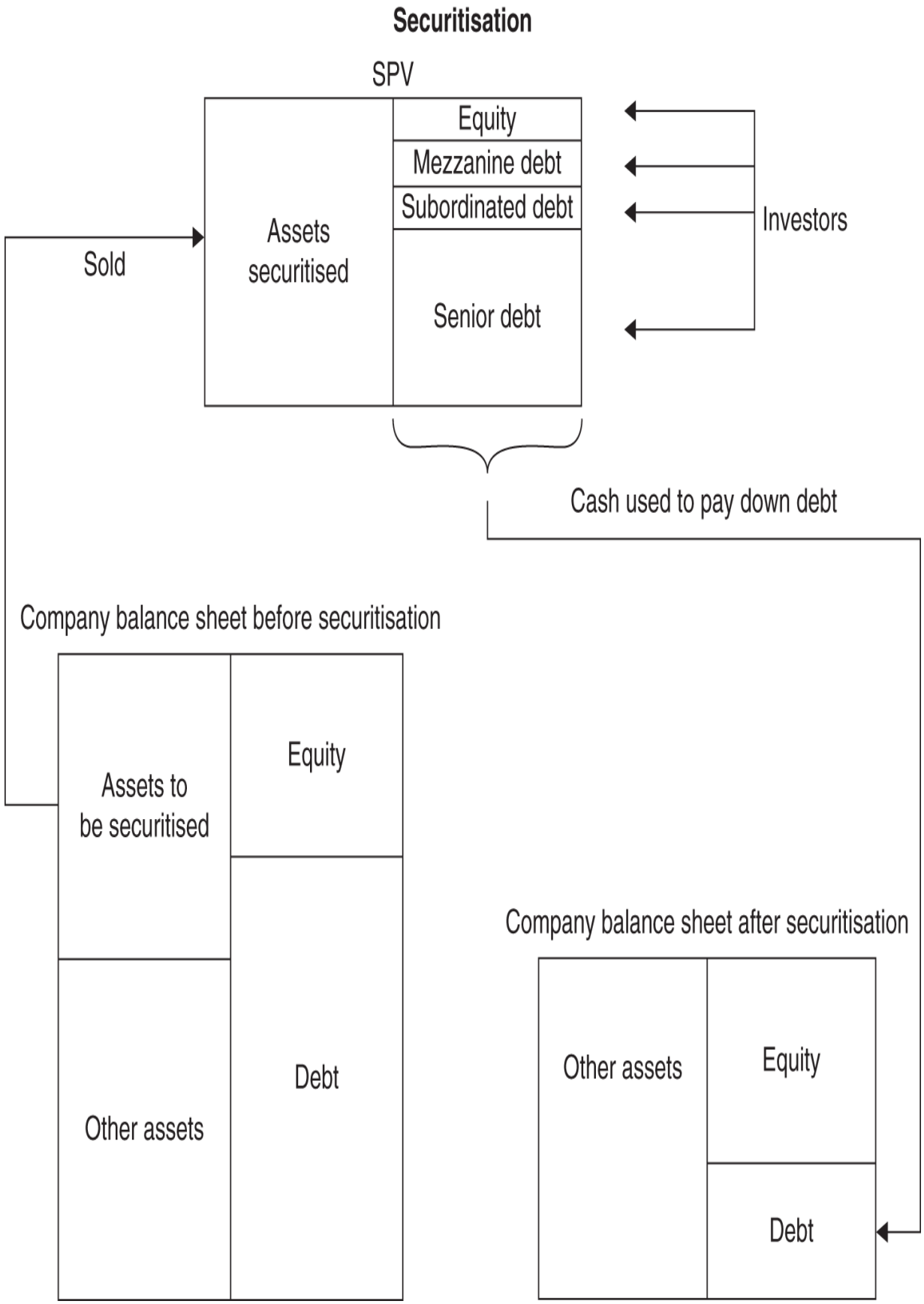
Sale and lease back is a procedure by which a company that owns a factory, an office block, a machine, etc. sells it to a leasing company or an investor, which immediately places it at the company's disposal through an ordinary rental agreement or an equipment or real-estate leasing agreement, depending on the nature of the asset sold.

These transactions are described further in Chapter 52.

6/ SECURITISATION

Trade receivables or inventories are acquired by an SPV (special purpose vehicle) so as to pool risks and take advantage of the law of large numbers. The SPV finances itself by issuing securities to outside investors: equity, mezzanine debt, subordinated debt, senior debt, commercial paper, etc., so as to offer different risk–return profiles to investors. The SPV, such as a

debt **securitisation** fund, receives principal payments emanating from the receivables it bought from the companies and uses the proceeds to cover its obligations on the securities it has issued.


Securitisation
SPV
Equity
Mezzanine debt
Subordinated debt
Senior debt
Assets securitised
Sold
Investors
Cash used to pay down debt
Company balance sheet before securitisation
Assets to be securitised
Equity
Other assets
Debt
Company balance sheet after securitisation
Other assets
Equity
Debt

To boost the rating of the securities, the SPV buys more receivables or inventories than the volume of securities to be issued, the excess serving as enhancement. Alternatively, the SPV can take out an insurance policy with an insurance company. The SPV might also obtain a short-term line of credit to ensure the payment of interest in the event of a temporary interruption in the flow of interest and principal payments.

Once isolated, certain assets are of higher quality than the balance sheet as a whole, thus allowing the company to finance them at preferential rates. That said, the cost of these arrangements is higher than that of straight debt, especially for a high-quality borrower with an attractive cost of debt. Hence, they are hard to put in place for less than €50m, except if the platform is syndicated between several firms.

For example, ArcelorMittal securitises its account receivables and Avis its rental fleet, while Glencore does the same thing with its lead, nickel, zinc, copper and aluminium inventories.

The introduction before 2008 of subprime loans in some securitisation conduits to boost performance brought many of the securitisation vehicles and, in turn, the technique into disrepute. In Europe and in the USA, securitisation arrangers now have to retain 5% of the credit risk of securitised assets for their own account. This provides an incentive for them to take a close look at the quality of the assets and not to “wash their hands” of them once the deal is set up and distributed, to the detriment of the final investors and the credibility of the securitisation itself.

7/ BONDS AND GUARANTEES AND EXPORT CREDIT

Bonds and guarantees are not credit lines as the bank does not provide the funds unless the firm defaults (in which case the bank will pay instead of the firm). They are off-balance-sheet commitments.

For the firm, a bank guarantee generally allows it to defer payment or not to provide a down payment (rents, customer advance payment).

Bid bonds are issued by the bank of a company that responds to a call for tenders to ensure that it will honour its business commitments if it is selected. **Performance bonds** are issued by a bank to guarantee the proper performance of a contract (construction, etc.) within a certain timeframe.

Finally, **warranty bonds** are issued from the commissioning of an installation to cover any defects found after delivery. They are used in the real-estate sector or for capital goods (construction of factories or power plants).

A corporate can ask a bank to issue a **financial guarantee** or **letter of credit** to secure a payment (representation and warranties, litigation). They also make it possible to obtain loans from another bank or other body more easily or on better terms, or to conclude a contract which, without the guarantee provided by the guarantor, could not have been envisaged.

The **documentary credit** ensures the successful completion and settlement of a commercial contract, most often between an exporter and an importer of different nationalities. The banks of the two trading partners guarantee their respective customers, which limits the risk of unpaid delivery or goods paid for but not delivered.

After signing the commercial contract between an importing buyer and an exporting seller, it is up to the buyer to initiate the issuance of the documentary credit by contacting its bank (issuing bank), which passes on to a correspondent bank the opening of a documentary credit payable on its coffers against the presentation of a list of documents predefined by the buyer. The seller will have the assurance of being paid when the bank has received and recognised the required documents as being in conformity.

There are several types of payment procedures (at sight, by deferred payment, by negotiation or discount or by acceptance of a draft), but their basis remains the same: to establish a relationship of trust between business partners who do not know each other.

The documentary credit is a method of payment, of guaranteeing payment, but also often facilitates financing (because it allows discounting), the precise terms of which are defined by the “Rules and Practices” of the International Chamber of Commerce (ICC).

The **stand-by letter of credit** (**SBLC**) is subject to the same operating rules as the documentary credit, defined by the “Rules and Practices” issued by the ICC. It is used to cover a current flow of transactions between a client and its supplier for an outstanding amount up to the limits predefined in the letter of credit.

Buyer's credit or **export credit** is used to finance export contracts of goods and/or services between an exporter and the buyer importing the goods/services. The banks granting the buyer's credit undertake to provide the borrower with the funds needed to pay the supplier directly according to the terms specified by the contract.

The borrower, in turn, gives the bank an irrevocable mandate to pay the funds only to the supplier. The agreement stipulates the interest rates, duration and repayment conditions of the loan, and any bank fees or penalties that may arise if the borrower fails to meet its obligations.

The credit agreement also specifies that the transaction is purely financial, since the borrower must repay the funds notwithstanding any disputes that may arise in the course of its business with the exporter. The advantages to the supplier are:

insurance against payment default;

the cost of the credit is not deducted from the contract while the risk level remains acceptable to the bank;

the portion of the contract that must be paid upon maturity is not on the balance sheet.

The credit risk taken by the bank setting up a buyer credit is partially covered by export credit agency under certain conditions of duration, rates, etc., which have been accepted by the signatory states of the “consensus” agreements (OECD countries). These agreements specify the rules for financing export contracts for capital goods and/or services benefiting from official support in order to neutralise the financing criterion in the evaluation of commercial offers. In addition to the guarantee of an export credit agency, official support applies to the terms of export financing, in particular the duration and rate of credit, which makes it very attractive compared to market financing.

Certain types of buyer's credit can also be used to finance major projects and thus resemble project financing, which we will discuss now.

8/ PROJECT FINANCING

Bankers' imaginations know no bounds when creating specialised bank financing packages that combine funding with accounting, tax, legal or

financial advantages. Sometimes lenders take the global risk of the group in the form of subordinated debts (see Chapter 24). In other cases they may only be taking the risk of one project of the group, which, most of the time, is isolated into a separate entity.

(a) Principle and techniques

Project financing is used to raise funds for large-scale projects with costs running into the hundreds of millions of euros, such as oil extraction, mining, oil refineries, the purchase of methane tankers, the construction of power plants or bridges, etc.

Lenders base their decision to extend such financing on an assessment of the project itself rather than the borrower, and on the projected cash flows generated by the project that will repay the credit. They rely on the project's assets as collateral for the debt.

This type of financing was first used in the early 1930s by American banks to extend financing to oil prospectors who could not offer the guarantees required for standard loans. The banks drew up loan contracts in which a fraction of the oil still in the ground was given as collateral and part of the future sales were set aside to repay the loan.

With this financial innovation, bankers moved beyond their traditional sphere of financing to become more involved, albeit with a number of precautions, in the actual risk arising from the project.

But it is all too easy to become intoxicated by the sophistication and magnitude of such financial structures and their potential returns. Remember that the bank is taking on far more risk than with a conventional loan, and could well find itself at the head of a fleet of super oil tankers of uncertain market value. Lastly, the parent company cannot completely wash its hands of the financial risk inherent in the project, and banks will try to get the parent company's financial guarantee, just in case.

When considering project financing, it is essential to look closely at the professional expertise and reputation of the contractor. The project's returns, and thus its ability to repay the loan, often depend on the contractor's ability to control a frequently long and complex construction process in which cost overruns and missed deadlines are far from rare. Project financing is not just a matter of applying a standard technique. Each individual project must

be analysed in detail to determine the optimal financing structure so that the project can be completed under the best possible financial conditions.

The financiers, the future manager of the project and the contractor(s) are grouped in a pool taking the form of a company set up specifically for the project. This company is the vehicle for the bank financing.

Clearly, project financing cannot be applied to new technologies which have uncertain operating cash flows, since the loan repayment depends on these cash flows. Similarly, the operator must have acknowledged expertise in operating the project, and the project's political environment must be stable to ensure that operations proceed smoothly. Only thus can investors and banks be assured that the loan will be repaid as planned.

In addition to investors and banks, two other players can take on an important role in project finance:

international financial organisations such as the World Bank and regional development banks like the EBRD,[3] especially if the project is located in a developing country. These institutions may lend funds directly or guarantee the loans extended by the other banks;

export-facilitating organisations like Bpifrance in France, Hermès in Germany or SACE in Italy, which underwrite both the financial and the commercial risks arising on the project.

(b) Risks and how they are hedged

The risks on large projects arise during three quite distinct stages:

when the project is being set up;

during construction;

during operations.

Risks arise as soon as the project is in the planning stage. Analysing a major project can take up to several years and requires considerable expertise and numerous technical and financial feasibility studies. All this can be quite costly. At this stage, no one is sure that the project will actually materialise. Moreover, when there is a call for tenders, the potential investors are not even sure that their bid will be retained.

But, of course, the greatest risk occurs during construction, since any loss can only be recouped once the facilities are up and running!

Some of the main risks incurred during the construction phase are:

Cost overruns or delays. These are par for the course on large projects that are complex and lengthy. Such risks can be covered by specific insurance that can make up for the lack of income subject to the payment of additional premiums. Any claims benefits are paid directly to the lenders of the funds, or to both borrowers and lenders. Another method is for the contractor to undertake to cover all or part of any cost overruns and to pay an indemnity in the event of delayed delivery. In exchange, the contractor may be paid a premium for early completion.

Non-completion of work, which is covered by performance bonds and contract guarantees, which unconditionally guarantee that the industrial unit will be built on schedule and with the required output capacity and production quality.

“Economic upheavals” imposed by the government (e.g. car factories in Indonesia, dams in Nigeria, with initial strong support by local governments, which was withdrawn later on because of cash shortages or a change of government) and arbitrary acts of government, such as changes in regulations.

Natural catastrophes that are not normally covered by conventional insurance policies.

As a result, the financing is released according to expert assessments of the progress made on the project.

Risk exposure culminates between the end of construction and the start of operations. At this point, all funds have been released but the activity that will generate the flows to repay them has not yet begun and its future is still uncertain. Moreover, a new risk emerges when the installations are delivered to the client, since they must be shown to comply with the contract and the client's specifications. Because of the risk that the client may refuse to accept the installations, the contract usually provides for an independent arbitrator, generally a specialised international firm, to verify that the work delivered is in conformity with the contract.

Once the plant has come on stream, anticipated returns may be affected by:

Operating risks *per se*: faulty design of the facilities, rising operating or procurement costs. When this occurs, the profit and loss account diverges from the business plan presented to creditors to convince them to extend financing. Lenders can hedge against this risk by requiring long-term sales contracts, such as:

take or pay: these contracts link the owner of the facilities (typically for the extraction and/or transformation of energy products) and the future users whose need for it is more or less urgent. The users agree to pay a certain amount that will cover both interest and principal payments, irrespective of whether the product is delivered and of any cases of *force majeure*;

take and pay: this clause is far less restrictive than take or pay, since clients simply agree to take delivery of the products or to use the installations if they have been delivered and are in perfect operating condition.

Market risks. These risks may arise when the market proves smaller than expected, the product becomes obsolete or the conditions in which it is marketed change. They can be contained, although never completely eliminated, by careful study of the sales contracts, in particular the revision and cancellation clauses which are the linchpin of project financing, as well as detailed market research.

Foreign exchange risks are usually eliminated by denominating the loan in the same currency as the flows arising on the project or through swap contracts (see Chapter 51).

Abandonment risk arises when the interests of the industrial manager and the bankers diverge. For example, the former may want to bail out as soon as the return on capital employed appears insufficient, while the latter will only reach this conclusion when cash flow turns negative. Here again, the project financing contract must lay down clear rules on how decisions affecting the future of the project are to be taken.

Political risks, for which no guarantees exist but which can be partly underwritten by state agencies.

Section 21.4 OTHER DEBT PRODUCTS

Since mid-2010, regulatory relaxations and new technologies have enabled the emergence of debt financing that involves neither banks nor markets.

Crowdlending allows companies, predominantly SMEs, to contract debt in the form of bonds from individuals on specialised Internet platforms such as October. Amounts per issuer range from a few tens of thousands of euros to €8m per 12-month period.

Some investment funds have specialised in granting loans directly to companies to finance them globally or some of their assets.

SUMMARY

The summary of this chapter can be downloaded from www.vernimmen.com.

The main debt products are:

bonds (long-term market products);

commercial paper (short-term market products);

short-, medium- or long-term borrowings including RCFs and term loans.

There are also other methods of financing based on assets of the firm:

discounting and factoring;

securitisation;

leasing and sale and lease back;

project finance.

Export credit is not *per se* a debt product as it will not generate a cash-in for the firm but is a way of avoiding unnecessary outlay of cash or to secure commercial relationships.

Debt documentation requires that the contracting company respect certain conditions (covenants) of which the major ones are financial covenants, financial decisions (restrictions on contracting additional debt, offering guarantees to other parties, share buybacks) and the control structure of the company.

Whatever their nature, banking or market, debt products increasingly have an ESG dimension either through the use of proceeds or through an interest rate whose level depends on the achievement of environmental, social or governance objectives.

QUESTIONS

1/Do banks take a risk when a firm issues commercial paper?

2/What other financial product can export credit be associated with?

3/What is the risk linked to discounting?

4/Why are small companies restricted in the choice of a debt product?

5/How do banks finance the loans they grant to corporates?

6/What is the interest of an RCF for a firm?

7/How can banks propose cheaper credit than bonds to corporates?

8/What is the difference between discounting and factoring?

9/Which services can be proposed by a factor?

10/In a securitisation transaction, is the firm that has sold assets to the SPV at risk if the value of the assets is not enough compared to the debt commitment?

11/Why do rating agencies request a backup line to grant a decent rating to a commercial paper issuance programme?

You'll find more questions at www.vernimmen.com.

ANSWERS

Questions

1/*Yes, as they grant backup lines.*

2/*An insurance contract.*

3/*Default of the client to pay.*

4/*Limited amounts do not allow the issue of market products (as they would be too illiquid).*

5/*Deposits, refinancing with the central bank, bonds, equity.*

6/*Secure access to funds.*

7/*Thanks to guarantees taken and through covenants, additional expected services sold.*

8/*Factoring is discounting with additional services.*

9/*Financing, collection of bills, insurance against bad debt, deconsolidation.*

10/*Normally not, as the SPV usually uses insurance or overcollateralisation to protect itself.*

11/*As commercial paper is short term, it is usually repaid thanks to a new issue of commercial paper. If for any reason the market disappears, the backup line allows repayment to be insured without jeopardising the liquidity of the firm.*

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NOTES

1 *See Section 25.6.*

2 *See Section 7.12 for the accounting and financial treatments of operating leases.*

3 *European Bank for Reconstruction and Development.*

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Chapter 22
SHARES

One of a kind, or one of many?

As we saw in Chapter 4, the capital that is injected or left in the business by investors, which is exposed to the various risks of commercial or industrial ventures, and for which in return they receive the profits of, is called equity.

A share or a stock is a security that is not redeemed – the investment can only be realised through a disposal – and whose revenue flows are uncertain. It is in compensation for these two disadvantages that shareholders have a say in managing the company via the voting rights attached to their shares.

The purpose of this chapter is to present the key parameters used in analysing stocks and show how the stock market operates. For a discussion of stock as a claim option on operating assets, refer to Chapter 34, and to find out more about stock as a claim on assets and commitments, see Chapter 31 on company valuation.

Section 22.1 BASIC CONCEPTS

This section presents the basic concepts for analysing the value of stocks, whether or not they are listed. Remember that past or future financial transactions could artificially skew the market value of a stock with no change in total equity value. When this happens, technical adjustments are necessary, as explained in Section 22.5 of this chapter. We will then assume that they have been done.

1/ VOTING RIGHTS

Shares are normally issued with one voting right each. For our purposes, this is more of a compensation for the risk assumed by the shareholder than a basic characteristic of stock.

A company can issue shares with either limited or no voting rights. These are known under different names, such as preference shares, savings shares or simply non-voting shares.

At the other extreme, companies in some countries, such as the US and Sweden, issue several types of shares ("A" shares, "B" shares, etc.) having different numbers of voting rights. Some shareholders use this to strengthen their hold on a company, as we will see in Chapter 41.

2/ EARNINGS PER SHARE (EPS)

EPS is equal to net attributable profit divided by the total number of shares issued. EPS reflects the theoretical value creation during a given year, as net profit belongs to shareholders.

There is no absolute rule for presenting EPS. However, financial analysts generally base it on earnings restated from non-recurring items, as shown below:

	Net attributable profit, group share
−	All non-recurring items (after tax)
+	Goodwill amortisation or impairment

ArcelorMittal's 2021 EPS was estimated in mid-2021 to be $4.99 (it was −$0.64 in 2020).

Some companies have outstanding equity-linked securities, such as convertible bonds, warrants and stock options. In this case, in addition to standard EPS, analysts calculate **fully diluted EPS**. We will show how they do this in Section 22.5.

3/ DIVIDEND PER SHARE (DPS)

Dividends are generally paid out from the net earnings for a given year, but can be paid out of earnings that have been retained from previous years. Companies sometimes pay out a quarterly (in the USA) or half-year (in the UK) dividend.

In 2021 ArcelorMittal paid a $0.30 dividend on 2020 results (it did not pay a dividend in 2020 on its 2019 results).

Some shares – like preference shares – pay out higher dividends than other shares or have priority in dividend payments over those other shares. They are generally non-voting shares.

4/ DIVIDEND YIELD

Dividend yield per share is the ratio of the last dividend paid out to the current share price:

$$\text{Dividend yield} = \frac{\text{Dividend per share}}{\text{Share price}} = \frac{DPS_0}{P_0}$$

The dividend yield on ArcelorMittal is 1% (dividend of $0.30 on a share with a price of $26.4).

> Yield is based on market value and never on book value.

The average yield on stocks listed on European stock markets is currently about 3%.

DIVIDEND YIELD – PAN-EUROPEAN SECTORS (AS OF 1 JANUARY)

Years	Automotive	Biotechnology	Chemistry	Defence	Financial Institutions	Food	Oil & Gas	Real Estate	Telecom	Utilities
1990	2.4%	1.1%	4.0%	6.6%	2.7%	3.1%	4.6%	3.3%	4.4%	4.7%
1995	0.8%	0.4%	3.1%	0.3%	3.1%	3.5%	4.0%	4.7%	4.1%	4.3%
2000	2.4%	0.1%	2.6%	2.7%	2.1%	2.7%	2.5%	2.8%	1.0%	2.8%
2005	2.5%	0.5%	2.4%	2.5%	2.7%	1.9%	2.5%	2.9%	1.9%	3.1%
2010	1.1%	0.5%	3.9%	2.8%	3.1%	2.4%	4.6%	3.5%	5.8%	5.6%
2015	2.2%	0.6%	3.6%	2.4%	3.3%	2.7%	5.3%	2.9%	4.1%	5.1%
2016	2.2%	0.5%	3.6%	2.3%	3.8%	2.7%	5.8%	2.7%	4.3%	4.8%
2017	2.4%	0.6%	3.1%	2.1%	3.9%	2.9%	4.7%	3.0%	4.7%	4.8%
2018	2.5%	0.5%	2.8%	1.7%	3.4%	2.5%	4.5%	2.8%	4.3%	4.4%
2019	3.6%	0.6%	4.6%	2.0%	4.6%	2.8%	4.9%	2.7%	5.0%	4.3%
2020	3.3%	0.4%	4.1%	1.6%	4.2%	2.2%	4.9%	2.4%	5.1%	3.7%
2021	2.3%	0.5%	3.6%	1.2%	3.2%	2.6%	6.7%	2.4%	4.4%	3.2%

Source: Factset, Datastream

5/ PAYOUT RATIO

The payout ratio is the percentage of earnings from a given year that is distributed to shareholders in the form of dividends. It is calculated by dividing dividends by earnings for the given year:

$$\text{Payout ratio} = \frac{\text{Dividend paid in respect of the results for the year } N}{\text{Net income for the year } N}$$

When the payout ratio is above 100%, a company is distributing more than its earnings; it is tapping its reserves. Conversely, a payout close to 0% indicates that the company is reinvesting almost all its earnings into the business. In 2018, European companies paid out an average of about 45% of their earnings.

It will be clear that the higher the payout ratio, the weaker future earnings growth will be. The reason for this is that the company will then have less funds to invest. As a result, fast-growing companies such as SolarWorld and Google pay out little or none of their earnings, while a mature company would pay out a higher percentage of its earnings. Mature companies are said to have moved from the status of a **growth stock** to that of an **income stock (also called a yield stock), i.e. a company that pays out in dividends a large part of its net income, such as a utility**.

The dividend is legally drawn on parent company profits. However, it should be assessed on the basis of consolidated net attributable profit – the only meaningful figure, as in most cases the parent company is merely a holding company.

2021 ArcelorMittal's payout ratio is not relevant as the company will pay a dividend whereas it was loss making (EPS of –$1.20) in 2020.

6/ BOOK VALUE OF EQUITY (OR NET ASSET VALUE) PER SHARE

Book value of equity per share is the accounting estimate of the value of a share. While book value may appear to be directly comparable to equity value, it is determined on an entirely different basis – it is the result of strategies undertaken up to the date of the analysis and corresponds to the amount invested by the shareholders in the company (i.e. new shares issued and retained earnings).

Book value may or may not be restated. This is generally done only for financial institutions and holding companies.

7/ COST OF EQUITY (EXPECTED RATE OF RETURN)

According to the CAPM (see Chapter 19), the cost of equity is equal to the risk-free rate plus a risk premium that reflects the stock's market (or systematic) risk.

$$k_E = r_f + \beta \times (r_M - r_f)$$

8/ SHAREHOLDER RETURN (HISTORICAL RATE OF RETURN)

In a given year, shareholders receive a return in the form of dividends (dividend yield) and the increase in price or market value (capital gain):

$$\frac{P_1 - P_0}{P_0} + \frac{\text{Div}_1}{P_0}$$

Total shareholder return (TSR) is calculated in the same way, but over a longer period. It reflects the IRR of the investment in the stock.

9/ LIQUIDITY

A listed security is said to be liquid when it is possible to buy or sell a large number of shares on the market without it having too great an influence on the price. Liquidity is a typical measure of the relevance of a share price. It would not make much sense to analyse the price of a stock that is traded only once a week, for example.

> A share price is relevant only if the stock is sufficiently liquid.

A share's liquidity is measured mainly in terms of free float, trade volumes and analyst coverage (number of analysts following the stock, quality and frequency of brokers' notes).

(a) Free float

The free float is the proportion of shares available to purely financial investors, to buy when the price looks low and sell when it looks high. Free float does not include shares that are kept for other reasons, i.e. control, sentimental attachment or “buy and hold” strategies.

Loyalty is (unfortunately) not a financial concept and a skyrocketing share price could make sellers out of loyal shareholders, thus widening the free float.

Free float can be measured either in millions of euros or in percentage of total shares.

(b) Volumes

Liquidity is also measured in terms of volumes traded daily. Here again, absolute value is the measure of liquidity, as a major institutional investor will first try to determine how long it will take to buy (or sell) the amount it has targeted. But volumes must also be expressed in terms of percentage of the total number of shares and even as a percentage of free float. Liquidity is generally considered good when more than 0.2% of the free float is traded each day.

10/ MARKET CAPITALISATION

Market capitalisation is the market value of company equity. It is obtained by multiplying the total number of shares outstanding (number of shares issued less the number of treasury shares[1], see Section 7.19) by the share price.

However, rarely can the majority of shares be bought at this price at the same time, for example, in an attempt to take control and appoint new management. Most often, a premium must be paid (see Chapters 31 and 45).

It is a mistake to take only the shares in free float in determining market capitalisation. All shares must be included, as market cap is the market value of company equity and not of the free float.

By way of illustration, you will find in the appendix to this book the top twenty market capitalisations of the world's major economies.

On 6 May 2021, ArcelorMittal had a market cap of $34,920m.

Section 22.2 MULTIPLES

In order to understand the level of stock prices, investors must make some comparisons with comparable investments (similar stocks). By doing so, they can arbitrage between stocks, taking into account their belief about the companies' qualities and the level of their prices. To achieve this objective, investors normally relate the stock price to a financial item.

There are two basic categories of multiples:

those which allow for a direct estimate of the market capitalisation. In this section, we will refer specifically to the price to earnings ratio (P/E);

those which are independent of the capital structure of the company. These multiples allow for the estimate of the value of the entire firm (firm or enterprise value) or, similarly, the market value of the capital employed. The EBIT multiple (EV/EBIT) and the EBITDA multiple (EV/EBITDA) will be presented in this section. Since capital employed is financed by equity and net debt, the enterprise value must then be allocated between creditors (first) and shareholders. The following formula shows how to derive the value of equity from the enterprise value:

$$\text{Enterprise value} = \text{Value of net debt} + \text{Value of equity}$$

and

$$\text{Value of equity} = \text{Enterprise value} - \text{Value of net debt}$$

1/ EBITDA AND EBIT MULTIPLES

(a) The principle

Investors interested in estimating the enterprise value of a company frequently find that the stock market believes that a fair value for similar companies could be, for example, eight times their EBIT (or operating profit). With a pinch of salt, the investor can then decide to apply the same multiple to the EBIT of the company they are considering.

Investors name this ratio the **EBIT multiple:**

$$\text{EBIT multiple} = \frac{\text{Enterprise value}}{\text{Operating profit}}$$

If the operating profit remains unchanged, and disregarding corporate income taxes and discounting, these figures imply that investors must wait eight years before they can recover their investment. Conversely, if the operating profit increases, they will not have to wait so long.

> The EBIT multiple corresponds to the purchase price of €1 of the operating profit.

In practice, when applying the multiple, financial analysts prefer using the operating profit of the current period or of the next period.

Where the comparison is made using companies with significant different corporate income tax rates (because they belong to different countries, for example), it is more appropriate to consider an operating profit net of taxes (net operating profit after tax, or NOPAT). This result can easily be obtained by multiplying the operating profit by (1 – the observed corporate tax rate). This is rarely done.

Similarly, EBITDA multiple can be computed as:

$$\text{EBITDA multiple} = \frac{\text{Enterprise value}}{\text{EBITDA}}$$

(b) The multiple drivers

Although the EBITDA/EBIT multiples are ratios that summarise a lot of information, their value is basically determined by three factors: the growth rate of the operating profit, the risk of capital employed and the level of interest rates.

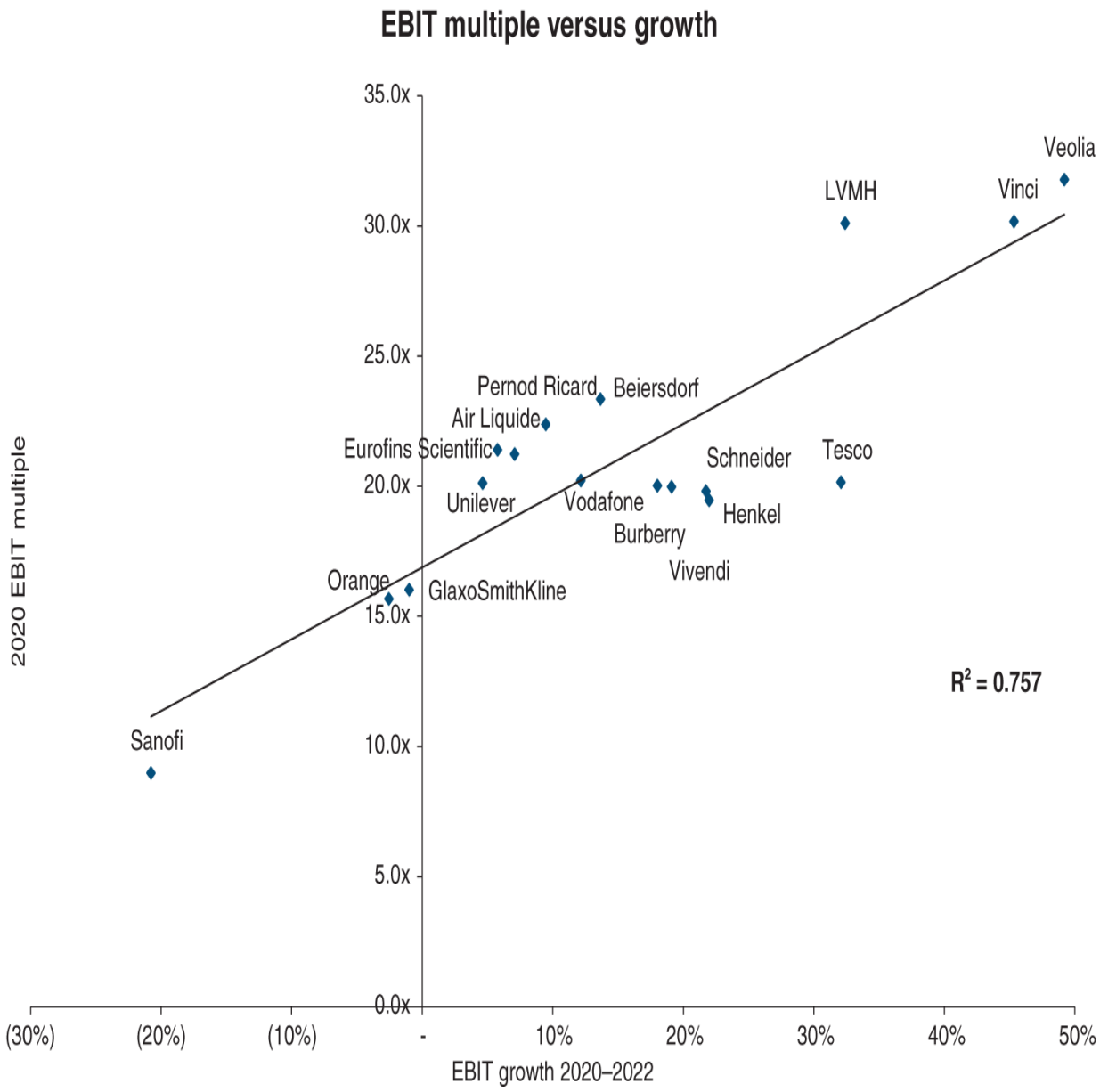
The growth rate of the operating profit. There is a certain degree of correlation between the multiple and the expected growth of the operating profit. This is no surprise. Investors will be more willing to pay a higher price if the operating profit is expected to grow at a high rate (as long as the firm creates value, i.e. the investments generate a sufficient return). They are now buying with a high EBITDA/EBIT multiple based on current EBITDA or operating profit but with a more reasonable EBITDA/EBIT multiple based on future EBITDA or operating profit that is expected to be much higher.

The reverse is also true: investors will not be ready to pay a high EBITDA/EBIT multiple for a company, the EBITDA or operating profit of which is expected to remain stable or increase slowly. Hence the low multiples for companies with low growth prospects.

The reader should also not forget that behind the growth of the EBITDA/operating profit is the growth of both revenues and EBITDA/operating margins.

> All other things held equal, strong EBITDA or operating profit growth prospects lead to a high EBITDA/EBIT multiple, low EBITDA or operating profit growth prospects lead to a low EBITDA/EBIT multiple.

The following graph shows the relation between the medium-term growth rate of the operating profit of some European companies and their multiples.



Source: Data from Exane BNP Paribas

The risk of the capital employed. The link between growth rate and multiples is not always verified in the market. Sometimes some companies show a low multiple and a high growth rate, and vice versa.

This apparent anomaly can often be explained by considering the risk profile of the company. Analysts and investors in fact do not take the expected growth rate for granted. Thus, they tend to counterweight the effects of the growth rate with the robustness of these estimates.

> All other things held equal, the higher the risk of the company, the lower the EBITDA/operating profit multiple; the lower the risk, the higher the multiple.

The level of interest rates. There is a strong inverse correlation between the level of interest rates and the EBITDA and EBIT multiples. This link is rather intuitive: our reader is, in fact, perfectly aware that high interest rates increase the returns expected by investors (think, for example, about the CAPM equation!), thus reducing the value of any asset.

> All other things held equal, the higher the level of interest rates, the lower the operating profit multiple; the lower the interest rates, the higher the multiple.

Generally speaking, we can say that the level of the multiple can be frequently explained – at *a specific moment* – by the current level of interest rates in the economy.

The EBITDA and EBIT multiples allow us to assess the company valuation compared to the overall market.

2/ PRICE TO EARNINGS (P/E)

(a) The principle

Even if the EBITDA and EBIT multiples have become very popular in the investor and analyst community, a ratio simpler to compute has been used for a while to determine share prices. The P/E (price/earnings ratio), which, when multiplied by the earnings per share (EPS), provides an estimate for the value of the share.

P/E is equal to:

$$\text{P/E} = \frac{\text{Price per share}}{\text{EPS}}$$

Another way to put this is to consider the aggregate values:

$$\text{P/E} = \frac{\text{Market capitalisation}}{\text{Net income}}$$

EPS reflects theoretical value creation over a period of one year. Unlike a dividend, EPS is not a revenue stream.

As an illustration, the following table shows the P/E ratios of the main markets since 1990. We can see the impact of the 2000 bubble on P/Es for technology, media, and telecommunications groups but also the impact of shifts in the automobile industry (electric, autonomous cars) in 2019.

While there is no obligation to do so, P/E is based on estimated earnings for the current year. However, forward earnings are also considered; for example, P/E_{N+1} expresses the current market value of the stock divided by the estimated earnings for the following year. For fast-growing companies or companies that are currently losing money, P/E_{N+1} or P/E_{N+2} are sometimes used, either to give a more representative figure (and thus avoid scaring the investor!) or because, in the case of loss-making companies, it is impossible to calculate P/E for year *N*.

The widespread use of P/E (which is implicitly assumed to be constant over time) to determine equity value has given rise to the myth of EPS as a financial criterion to assess a company's financial strategy. Such a decision might or might not be taken on the basis of its positive or negative impact on EPS. This is why P/E is so important, but it also has its limits, as we will demonstrate in Chapters 26, 27 and in Section IV.

HISTORICAL P/E RATIOS – PAN-EUROPEAN SECTORS (AS OF 1 JANUARY)

Years	Automotive	Biotechnology	Chemistry	Defence	Financial Institutions	Food	Oil & Gas	Real Estate	Telecom	Utilities
1990	6.7	21.7	8.3	6.9	16.1	14.1	11.2	24.8	12.8	11.1

Years	Automotive	Biotechnology	Chemistry	Defence	Financial Institutions	Food	Oil & Gas	Real Estate	Telecom	Utilities
1995	13.4	30.4	13.5	14.3	14.1	12.9	17.3	20.4	12.7	13.4
2000	13.2	180.5	18.4	19.0	19.3	17.1	38.5	21.2	51.7	17.3
2005	12.6	25.6	24.9	32.6	15.8	17.8	15.4	19.6	20.5	13.9
2010	52.5	19.0	20.4	10.4	13.8	11.8	18.4	13.0	12.3	11.2
2015	8.6	25.0	14.9	17.2	13.4	22.3	11.0	17.1	17.0	13.6
2016	9.7	40.3	13.4	17.1	11.9	16.3	16.8	17.8	20.2	14.0
2017	9.3	31.5	19.0	19.7	12.5	24.2	25.1	17.1	13.5	13.7
2018	9.0	42.5	17.9	27.3	12.8	25.5	21.7	18.2	15.5	13.4
2019	6.2	22.8	10.0	21.5	10.1	18.9	11.8	13.9	15.3	13.8
2020	8.9	37.4	8.1	21.4	11.6	27.2	15.9	19.6	17.5	13.2
2021	22.8	42.4	22.5	24.1	11.8	19.8	85.4	21.0	15.0	20.5

Source: Data from Factset, Datastream

P/E is conceptually similar to the EBIT multiple, and even more so to the NOPAT multiple. The latter is a division of enterprise value by after-tax operating profit, while P/E is a division of market value of equity by net profit.

Hence, many of the things we have said about the EBIT multiple also apply to P/E:

Another way of understanding P/E is to note that it expresses market value on the basis of the number of years of earnings that are being bought. Thus, an equity value of 100 and earnings of 12.5 means the P/E is 8. This means that if EPS remains constant, the investor will have to wait eight years to recover their investment, while omitting corporate income taxes and discounting. If the EPS rises (falls), the investor will have to wait less (more) than eight years.

In an efficient market, the greater the EPS growth, the higher the P/E and vice versa (on condition that the firm creates value, i.e. has a higher ROE than the rate of return required by shareholders).

The greater the perceived risk, the lower the P/E and vice versa.

P/E is inversely proportional to interest rates: all other factors being equal, the higher the interest rates, the lower the P/Es and vice versa, again assuming efficient markets.

P/E is used in the same way as the EBITDA or EBIT multiple. To value a company, it is useful to set it alongside other companies that are as comparable as possible in terms of activity, growth prospects and risk, and then apply their P/E to it.

P/E reflects a risk that the EBIT multiple does not – financial structure – which comes on top of the risk presented by the operating assets.

> P/E can only be used for valuation purposes if the comparable companies have the same EPS growth and the same risks on both the operating and financial levels.

(b) P/E and investors' required rate of return

Inverse P/E, also called earnings yield, is sometimes mistakenly used in approximating investors' required rate of return. This should only be done in those very rare cases where earnings growth is nil and the company pays out 100% of its earnings. Here is our reasoning:

$$P = \frac{DPS}{k_E} = \frac{EPS}{k_E}$$

Then:

$$P/E = \frac{p}{EPS} = \frac{1}{k_E}$$

and thus:

$$\frac{1}{P/E} = k_E$$

In most cases, companies are growing and the inverse P/E is below the required rate of return. Using the inverse P/E to approximate the required rate of return would seriously underestimate the latter – a big mistake.

The P/E of a company with an EPS of 12 that is trading at 240 would then be:

$$\frac{240}{12} = 20$$

The inverse P/E is just 5%, whereas the required return nowadays is probably about 8%.

For a mature company, the inverse P/E is above the shareholders' required rate of return. Using the inverse P/E to approximate required rate of return would overestimate the rate of return – another big mistake.

All in all, the inverse P/E reflects only an immediate accounting return for a new shareholder who has bought the share for *V* and who has a claim on EPS:

$$\text{Accounting rate of return} = \frac{EPS}{V} = \frac{1}{\text{P/E}}$$

A very low return means that shareholders expect EPS growth to be strong enough to ultimately obtain a return commensurate with their required rate of return.

A very high rate means that immediate return is uncertain and shareholders expect negative EPS growth to ultimately bring accounting return closer to their required rate of return.

A normal rate, i.e. in line with the required rate of return, means that EPS growth is expected to be nil, and the investment is considered a perpetual annuity.

3/ OTHER MULTIPLES

Apart from the EBIT multiple and the P/E, investors and analysts sometimes use the following multiples.

(a) Sales multiple

Sometimes the value of the firm is assessed in proportion to its sales, and the ratio enterprise value/sales is then computed. This ratio is often used to derive the value of shops or very small companies. For example, a rule of thumb holds that within the food industry, businesses are worth twice the amount of their sales, whereas a telecoms company is worth three times its sales.

Using such multiples implies that the compared firms have the same type of margin. It implies somehow a normative return over sales for firms in a certain sector.

We believe that sales multiples should not be used for mid-sized or large companies as they completely disregard profitability. They have often been used in the past, in times of bull markets, to value emerging technology, for example, as such companies did not show a positive EBIT!

The same type of criticism can be levelled against multiples of numbers of subscribers, numbers of clicks, etc., or other multiples of volume of activity. These multiples not only assume a comparable return over sales but also the same revenue per unit.

(b) Free cash flow multiple

The ratio of enterprise value to free cash flow, or EV/FCF, is a concept similar to the multiple of operating income *mutatis mutandis*. It represents the number of times free cash flow is capitalised by the enterprise value.

This ratio should be a much better indicator than the EBIT multiple, whose accounting nature of the denominator makes it susceptible to manipulation. Indeed, free cash flow is the cash flow that the firm can redistribute to its fund providers, shareholders and lenders, after financing its investments. However, it is of little significance for companies with weak or negative cash flows because they are in a strong growth phase or at the bottom of the cycle.

In other words, this ratio only makes sense for mature groups whose investments are stable, making free cash flow very significant. The inverse of this ratio is called free cash flow yield.

(c) Price to book ratio (PBR)

The PBR (price to book ratio) measures the ratio between market value and book value:

$$\text{PBR} = \frac{\text{Price per share}}{\text{Book value per share}} = \frac{\text{Market capitalisation}}{\text{Book value of equity (net worth)}}$$

The PBR can be calculated either on a per share basis or for an entire company. Either way, the result is the same.

It may seem surprising to compare book value to market value, which, as we have seen, results from a company's future cash flow. Even in the event of liquidation, equity value can be below book value (due, for example, to restructuring costs, accounting issues, etc.).

> There is no direct link between book value and market value.

However, there is an economic link between book value and market value, as long as book value correctly reflects the market value of assets and liabilities.

It is not hard to show that a stock's PBR will be above 1 if its market value is above book value, when the ROE is above the required rate of return (k_E). The reason for this is that if a company consistently achieves 15% ROE, and the shareholders require only 10%, then a book value of 100 would mean an equity value of 150, and the shareholders will have achieved their required rate of return:

$$\frac{15\% \times 100}{150} = 10\% \quad \text{and} \quad \text{PBR} = 1.5$$

However, the PBR will be below 1 if the ROE is below the required rate of return (k_E).

Theoretically, a sector cannot show equity value below book value for long, as sector consolidation will soon intervene and re-establish a balance, assuming that markets are efficient. Nor can a sector have equity value

higher than book value for long, as new entrants will be attracted to the sector and bring down the abnormally high returns. Market equilibrium will sooner or later have been re-established.

As an illustration, here are the PBRs seen on the main European markets since 1990:

PBR – PAN-EUROPEAN SECTORS (AS OF 1 JANUARY)

Years	Automotive	Biotechnology	Chemistry	Defence	Financial Institutions	Food	Oil & Gas	Real Estate	Telecom	Utilities
1990	1.2	nm*	1.5	0.9	1.5	1.8	1.7	1.2	1.5	1.3
1995	1.2	nm*	1.5	1.3	1.1	1.7	1.9	1.0	1.7	1.5
2000	1.8	5.4	2.2	2.2	2.0	1.8	2.6	0.9	4.2	2.2
2005	1.1	3.8	1.7	1.7	1.8	3.9	2.9	1.3	3.0	2.2
2010	0.9	3.4	2.0	1.6	1.1	3.5	1.8	1.0	2.3	1.6
2015	1.2	5.2	2.1	2.7	1.0	3.7	1.0	1.2	2.4	1.2
2016	1.2	6.7	2.0	3.6	1.0	3.7	1.0	1.3	2.6	1.3
2017	1.1	6.2	2.4	3.8	0.9	3.7	1.3	1.1	2.3	1.4
2018	1.2	5.3	2.6	3.9	1.1	4.0	1.4	1.3	2.6	1.5
2019	0.9	4.1	1.6	3.9	0.9	3.7	1.3	1.1	2.3	1.5
2020	0.9	5.1	1.6	5.6	1.0	5.0	1.2	1.3	2.3	1.8
2021	1.1	5.8	2.0	5.6	0.9	5.1	1.1	1.3	2.0	2.2

* *nm = not meaningful*

Source: Data from Factset, Datastream

Section 22.3 KEY MARKET DATA

We are now able to fill in the blanks of the chart below, but it will only make sense if you have first assessed the company's strategy and finances.

We have filled in the data for ArcelorMittal, whose free float is significant (c. $18bn) and is covered by 20 analysts.

ArcelorMittal's share price is highly dependent on changes in raw material prices, in particular steel and iron ore, the price of which has decreased significantly between 2014 and 2016, and again between 2018 and 2019 as a result of trade tensions between China and the United States. As a result, ArcelorMittal's share price was halved between end 2014 and end 2015, before being multiplied by 3.5 since its low of February 2016, following which it then crashed by 50% from its highs of early 2018 and was again multiplied by 3 from a low point in May 2020. This is a cyclical investment!

In 2018, the payment of a symbolic dividend started again, after having stopped in 2016, given its negative free cash flows. Payment of dividend was again suspended in 2020 and resumed in 2021.

As we noticed earlier, ArcelorMittal does not create value, its ROE (9.4% in 2018) being negative below the return required by shareholders (c. 12% given the risk). Its market capitalisation is therefore below the book value of equity (even if lowered in 2015 by exceptional impairment).

Liquidity is very high, with over 1% of capital exchanged on average every day.

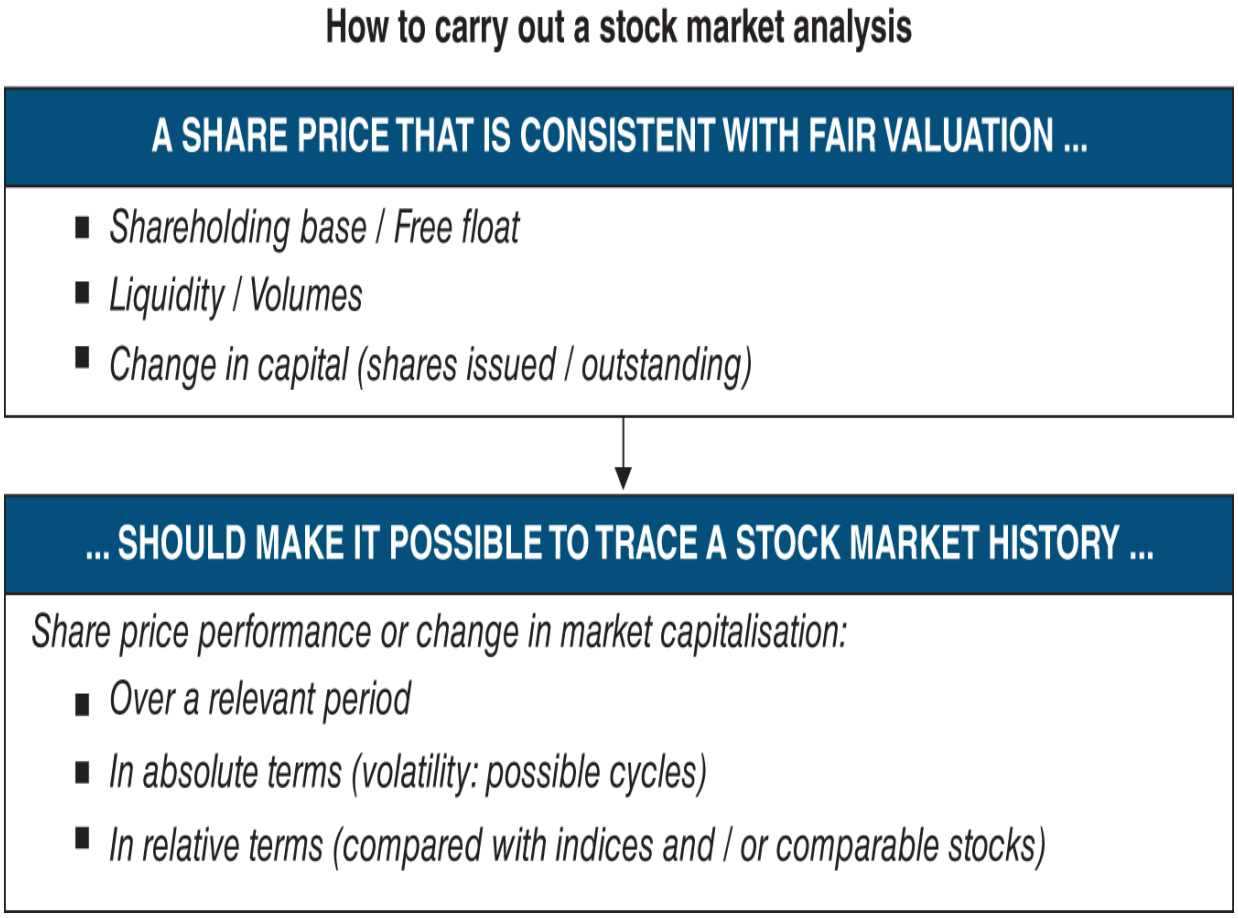
KEY MARKET DATA ON ARCELORMITTAL

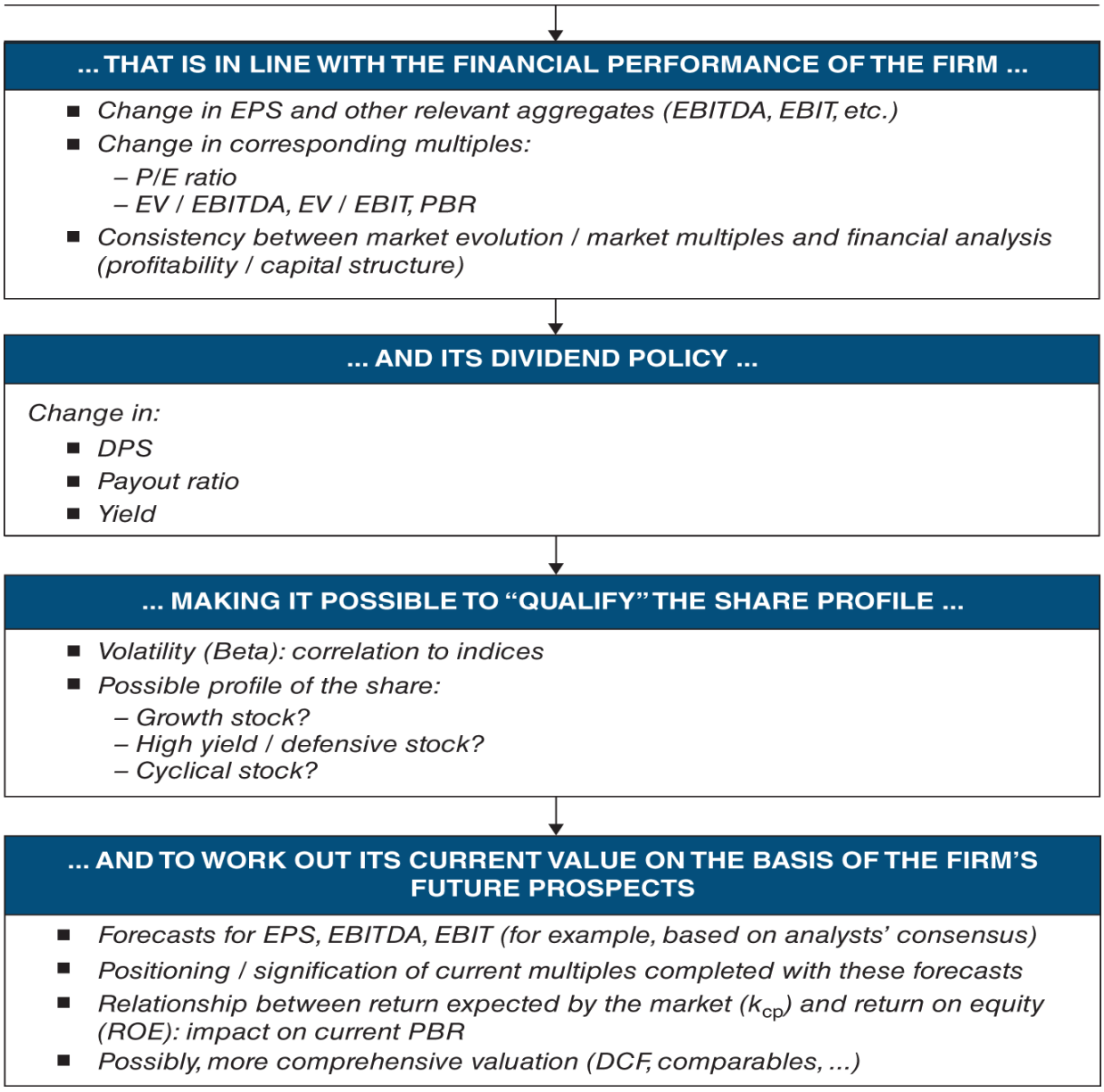
	Past		Current		Future
In $	**2019**	**2020**	**2021**	**2022**	**2023**
Adjusted share price					
High	24.24	19.25	26.37		
Low	12.53	6.46	17.58		
Average or last	17.54	19.16	26.37		
Absolute data					
Number of fully diluted shares (m)	1,021	1,080	1,080		
Market capitalisation (m)	17,908	20,693	28,480		
Equity, group share (m)	38,521	38,280	43,885	46,054	48,165
Value of net debt (m)	19,997	14,000	11,437		
Enterprise value (m)	39,999	40,690	42,480		
Multiples					
Fully diluted EPS	–2.40	–0.68	5.10	3.51	3.07
EPS growth	n.s.	n.s.	n.s.	–31%	–13%
P/E	n.s.	n.s.	5.2	7.5	8.6
Operating profit (m)	1,202	451	8,334	5,664	4,872
EBIT multiple	35.3	n.s.	5.1	7.5	8.7
Price/book ratio (PBV)	0.5	0.5	0.5		
Dividend					
Dividend per share (DPS)	0.30	0.00	0.30	0.43	0.47
DPS growth	n.s.	n.s.	n.s.	43%	9%
Net yield	1.7%	0.0%	1.1%		
Payout	–12%	n.s.	6%	12%	15%

	Past		Current		Future
In $	**2019**	**2020**	**2021**	**2022**	**2023**
Return					
Beta (β)	1.9	2.4	2.1		
Risk premium: $r_M - r_F$	6.8%	10.3%	8%		
Risk-free rate: r_F	–0.4%	–0.5%	–0.5%		
Required rate of return: k_E	12.5%	24.2%	16.3%		
Return on equity: r_E	–6.4%	–1.9%	12.6%		
Actual return (capital gains and dividends)	–15%	9%	39%		
Liquidity					
Free float	62.4%	64.4%	64.4%		
Share of capital traded daily	0.55%	0.54%	0.62%		
Number of analysts covering the stock	24	21	20		

Section 22.4 HOW TO PERFORM A STOCK MARKET ANALYSIS

In order to perform a stock market analysis, we advise readers to follow the following battle plan tailored by Marc Vermeulen:





Readers who are not new to corporate finance are advised to follow on from this chapter by reading Chapter 31, which is the logical continuation of this chapter.

Section 22.5 ADJUSTING PER SHARE DATA FOR TECHNICAL FACTORS

1/ REWRITE HISTORY, IF NECESSARY

“Let's not mix apples with oranges.” This old saying applies to the adjustment of per share data after the detachment of rights and for free share awards and rights issues which, **from a technical point of view**, can modify the value of a stock.

> Studying past share prices only makes sense if they are comparable; that is, if they have been adjusted for variations that are due solely to technical factors. Prices and per share data (EPS, DPS, …) prior to the detachment of a right are adjusted by multiplying them by what is called the “adjustment factor”.

(a) Free share awards

Suppose a company decides to double its equity by incorporating its reserves, and issues one new share for each existing share. Each shareholder is then the owner of twice as many shares without having paid additional funds and with no change to the company's financial structure. The unit value of the shares has simply been divided into two.

Naturally, the company's equity value will not change, as two shares will be equal to one previously existing share. However, the share price before and after the operation will have to be adjusted to obtain a comparable series.

In this case, simply divide the shares existing after the free share award by two. The adjustment coefficient is 1/2.

More generally, if new shares are issued for N already existing shares, then the adjustment coefficient is as follows:

$$\frac{N}{N+N'}$$

(b) A rights issue with an exercise price below the current share price

This is the second reason we might have to adjust past per share data. We will go further into detail in Chapter 25, which deals with share offerings.

To subscribe to the new shares, investors must first buy one or more preemptive subscription rights detached from previously existing shares, whose price is theoretically such that it doesn't matter whether they buy previous existing shares or use the rights to buy new ones. The detachment of the right from the existing shares makes an adjustment necessary.

For a rights issue, the adjustment coefficient is:

$$\frac{\text{Share price after detachment}}{\text{Share price before detachment}} = \frac{\text{Share price after detachment} - \text{Rights}}{\text{Share price before detachment}}$$

If P is the price of the already existing share, E the issue price of the new shares, the number of new shares and N the number of already existing shares, then the adjustment coefficient will be equal to:

$$\frac{N \times P + N' \times E}{(N' + N) \times P}$$

More generally, the adjustment coefficient is equal to the price after detachment of the right (either the right to receive a free share or the right to buy a new one) divided by the price before detachment of the right. This rule applies, for example, to the free distribution of warrants.

To make the adjustment, simply multiply all the share data (e.g. price, EPS, DPS, BV/S) before the detachment by this coefficient.

As you have seen, the adjustment consists in rewriting past stock performance to make it comparable to today and tomorrow, and not the reverse.

Henceforth, we will assume all prices to have been adjusted.

2/ THE IMPACT OF FUTURE TRANSACTIONS

When equity-linked securities (convertible bonds, mandatory convertibles, bonds with warrants attached, stock options, etc.) have been issued, financial managers must factor these potential new shares into their per share data. Here again, we must adjust in order to obtain an average number of outstanding shares.

As there is at least potential dilution, we have to assume full conversion in calculating the per share data (EPS, BV/S, etc.) on a fully diluted basis. This is easy to do for convertible bonds (CBs). Simply assume that the CBs have been converted. This increases the number of shares but lowers financing costs, as interest is no longer paid on the CBs.

For warrants (or stock options), two methods can be used. The first method, called the **treasury method**, is commonly used: it assumes investors will exercise their in-the-money[2] warrants and the company will buy back its own shares with the proceeds. The company thus offsets some of the dilution caused by the exercise of the warrants. This is the method recommended by the IASB.

The following example will illustrate the method: on 1 September 2016, Loch Lomond Corporation decided to issue 100,000 equity warrants exercisable from 1 January 2019 to 1 January 2023 at one share at €240 per warrant.

In 2021, EPS is €10m (net income 2021) divided by 1,000,000 (number of shares), i.e. €10.

As of 31 December 2021, Loch Lomond's share price is €300, all the warrants are in the money and thus are assumed exercised: 100,000 new shares are issued. The exercise of the warrants raises the following sum for the company: 100,000 × €240 = €24,000,000.

The company could use this money to buy back 80,000 of its own shares trading at €300. Fully diluted EPS can be computed as follows:

$$2021\ \text{EPS} = 10{,}000{,}000/(1000{,}000 + 100{,}000 - 80{,}000) = €9.80$$

Note that only in-the-money diluting securities are restated; out-of-the-money securities are not taken into account.

The second method, called the **investment of funds method**, assumes that all investors will exercise their warrants and that the company will place the proceeds in a financial investment. Let's go back to that last example and use this method.

In this method, we assume all warrants are exercised by investors and the proceeds are invested at 0.2% after taxes pending use in the company's industrial projects. Fully diluted EPS would be as follows:

$$2021\ \text{EPS} = \frac{100{,}000 \times 240 \times 0.2\% + 10{,}000{,}000}{1{,}000{,}000 + 100{,}000} = €9.13$$

As can be seen, the two methods produce different results as a direct consequence of the different uses of the cash proceeding from the exercise of warrants.

The treasury method can be considered to be the closest to the financial markets, as the main figure it uses is the company's share price. However, the treasury method assumes that the best investment for a company is to buy back its own shares.

SUMMARY

The summary of this chapter can be downloaded from www.vernimmen.com.

A stock market analysis of a firm should be performed after having checked the liquidity of the stock and understood the shareholder base. It is centred on the company's value, or its stock market performance if listed, which should be compared to the financial performance of the firm, multiples (especially EBITDA, EBIT multiple and P/E), dividends and returns, compared with required returns.

Dividends are analysed by looking at dividend yields (dividend on the share price) and the payout ratio (dividend on net profit).

The P/E (price to earnings) ratio is the ratio of the value of the share to EPS (earnings per share). Changes in P/E follow future EPS growth and move in the opposite direction from interest rates and risk (financial and operational).

It is only when the company pays out all of its profits and when financial and industrial markets are in equilibrium that inverse P/E (also called earnings yield) is equal to shareholders' required rate of return. Generally, the inverse P/E criterion results in an underestimation of shareholders' required rate of return.

The EBITDA and EBIT multiples are other valuation multiples, which are computed as enterprise value (i.e. value of debt and equity) divided by EBITDA or EBIT.

It should be noted that a stock market analysis should be performed only after the market price has been adjusted for certain past transactions (stock split, rights issue); certain future events (conversion of convertible bonds, exercise of warrants or stock options) can also be taken into account.

QUESTIONS

1/Why is adjustment necessary?

2/Define growth stock and income stock.

3/What are the growth prospects for a company that pays out all of its profits?

4/Does a “high” P/E necessarily mean that the company is experiencing high growth?

5/What assumptions must be made for inverse P/E to provide an approximate estimate of required rate of return?

6/Will a change in required rate of return have a greater impact on a company that pays out 75% of its profits than on a company that has a payout ratio of 5%, but which should increase to 75% in 25 years?

7/Will a share with a higher than average required rate of return for the same risk be undervalued or overvalued?

8/If dividend growth is higher per share than for the total amount of dividends paid out, what is this a sign of? If dividend growth is higher for the total amount of dividends paid out than the payout per share, what is this a sign of?

9/What does a PBR that is much higher than 1 mean?

10/What are the three drivers of the level of EBIT multiple?

11/The higher the interest rates, the higher the EBIT multiple. True or false?

You'll find more questions at www.vernimmen.com.

EXERCISES

1/You buy a stock which has the following features:

price: €500

EPS: €33.3

payout ratio: 25%

projected EPS growth 15%

What will EPS have to be equal to in year 3 for you to get a 12% return on your investment? What will the share be worth then?

2/What is your view of the following companies?

Company	Share price	2020	EPS (€)2021e	2022e	Payout	Yield	EPS growth (2020–2022)	BV/S	P/E 2021	Beta
Glencore (£)	3.12	–0.14	0.42	0.38	n.s.	6.1%	n.s.	2.83	7.4	1.87
Ahold-Delhaize (€)	22.84	1.30	1.83	1.90	69%	5.5%	21%	11.7	12.5	0.43
Tesla ($)	663.5	2.24	4.47	6.16	0%	0.0%	66%	23.5	148.4	2.00

The risk-free rate is –0.3%. The market risk premium is 8%.

3/For each of the following shares, provide an approximation of the missing figures (?) and then give your view of each share.

	Share A	Share B	Share C	Share D
P/E	10	25	7	50
Payout ratio *d*	95%	20%	20%	?
Annual EPS growth after 5 years: *g*	?	30%	5%	30%
Long-term debt/shareholders' equity	0.15	0.20	0.25	8
ROE	10%	30%	?	90%
PBR	1	?	0.4	45

ANSWERS

Questions

1/*Because a share is no longer the same after a right has been detached.*

2/*Growth stock: a stock which does not pay out much but is likely to in the future (high expectations of capital gains). Income stock: a stock that pays out a high dividend given the lack of investment opportunities (low expectations of capital gains).*

3/*Zero, unless there is an improvement in productivity or an upturn in the economy.*

4/*Generally, yes, but not if the company is experiencing problems (drop in profits, anticipated restructuring, or cyclical if at the bottom of the cycle).*

5/*That the company will pay out all of its profits in dividends, that profits will be constant and that the markets will be in equilibrium.*

6/*No, on the contrary, the latter will be more sensitive as a result of the long period that will elapse before any inflows are received.*

7/*Undervalued, because sooner or later, investors will realise their mistake and lower their required rate, which will increase the value of the share.*

8/*A capital reduction took place. A capital increase took place.*

9/*That the rate of return on shareholders' equity is much higher than that required by shareholders.*

10/*EBIT growth rate, risk, interest rates.*

11/*False, it is the other way round.*

Exercises

A detailed Excel version of the solutions is available at www.vernimmen.com.

1/*P/E = 13.1, V = €665.*

2/*Glencore is a cyclical company at the top of the cycle in 2021. The low 2021 P/E (7.4x) reflects the anticipated decline in earnings in 2022. Its dividends are relatively high relative to loss per share in 2020 and to share price (6.1% yield). Glencore has a return on equity in line with the rate of return required by its shareholders. As a result, the share price is close to the book value of the shareholders' equity.*

Ahold-Delhaize is a mature company: its results nevertheless show a relatively sustained growth in a favourable economic context for food retailing. Its risk is low given its sector. The distribution policy is relatively generous because the company does not need to invest heavily. The return on equity (15.6%) is well above the rate required by investors (2.9%), the share is valued at almost twice equity per share.

Tesla is a very fast-growing company that will only become profitable in 2021. Its PER 2021: 148 reflects very strong expected growth even after that date. Value creation is very important (price of $663, 28 times higher than equity per share). It is anticipated and not yet realised!

3/*The g of A is very low at around 0%. PBR of B = P/E × ROE = 7.5. ROE of C = PBR/P/E = 5.7%. The d of D: probably very low, given the amount of debt and the very high growth rate. A is very close to an annuity. B is growing briskly with excellent returns. The returns achieved by C will not meet the requirements of its shareholders and it should pay out much more (see Chapter 36). D's returns on shareholders' equity are exceptional, which is explained by a very high leverage effect.*

BIBLIOGRAPHY

J. Byun, M. Rezoff, Long-run performance after stock splits 1927 to 1996, *Journal of Finance*, **58**(3), 1063–1086, June 2003.

For institutional aspects regarding stock markets, see www.world-exchanges.org, where the reader can find links to the 250 market infrastructures belonging to the World Federation of Stock Exchanges.

NOTES

1 *This amendment is rarely taken into consideration, much to our regret.*

2 *An in-the-money warrant is a warrant whose exercise price is below the market price of the underlying asset.*

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Chapter 23
OPTIONS

The haunted house, or how to pay for being frightened!

Options are more complex than shares or bonds. Moreover, in their daily use they have more to do with financial management than finance. However, we will see that many financial products (warrants, stock options) can be analysed as options or as the combination of an option and a less risky asset. Have some fun by discovering the options hidden in any financial product!

A convertible bond can be seen as a combination of a conventional bond and an option. An undrawn revolving credit facility can be analysed as an option on a loan.

We will also examine how options theory can be applied to major financial strategy decisions within a company.

> Options are an effective tool of analysis whose applications are limited only by financial managers' imaginations.

The purpose of this chapter is not to make you a wizard in manipulating options or to teach you the techniques of speculation or hedging with options, but merely to show you how they work in practice.

Section 23.1 DEFINITION AND THEORETICAL FOUNDATION OF OPTIONS

An option gives you the right to buy or sell an asset at a predetermined price during (or on) a predetermined period (or day).

1/ SOME BASIC DEFINITIONS

There are **call** (buy) **options** and **put** (sell) **options**. The asset that can thereby be bought or sold is called the **underlying asset**. This can be either a financial asset (stock, bond, Treasury bond, forward contract, currency, stock index, etc.) or a physical one (a raw material or mining asset, for example).

The price at which the underlying asset can be bought or sold is called the **strike price**. The holder of an option may exercise it (i.e. buy the underlying asset if they hold a call option or sell it if they hold a put option) either at a given date (**exercise date**) or at any time during a period called the **exercise period**, depending on the type of option held.

A distinction is made between **US-style options** (the holder can exercise their right at any moment during the exercise period) and **European-style options** (the holder can only exercise their right on the exercise date). Most listed options are US-style options, and they are found on both sides of the Atlantic, whereas most over-the-counter (OTC) options are European-style.

Legally speaking, call options are a promise to sell made by the seller of the call option to the buyer of the call option.

Here are two examples:

Let's say Peter sells Helmut a call option on the car manufacturer BMW having an €85 strike price and maturing in nine months. For nine months (US-style option) or after nine months (European-style option), Helmut will have the right to buy one BMW share at a price of €85, regardless of BMW's share price at that moment. Helmut is not required to buy a share of BMW from Peter, but if Helmut wants to, Peter must sell him one for €85.

Obviously, Helmut will exercise his option only if BMW's share price is above €85. Otherwise, if he wants to buy a BMW share, he will simply buy it on the market for less than €85.

Now let's say that Paul buys from Clara put options on $1m in currency at an exchange rate of €1.1/$, exercisable six months from now. Paul may in six months' time (if it's a European-style option) sell $1m to Clara at €1.1/$, regardless of the dollar's exchange rate at that moment. Paul is not required to sell dollars to Clara but, if he wants to, Clara must buy them from him at the agreed price.

Obviously, Paul will only exercise his option if the dollar is trading below €1.1.

> Legally speaking, put options are a promise to buy made by the seller of the put option to the buyer of the put option.

The above examples highlight the fundamentally asymmetric character of an option. An option contract does not grant the same rights or obligations to each side. **The buyer of any option has the right but not the obligation, whereas the seller of any option is obliged to follow through if the buyer requests.**

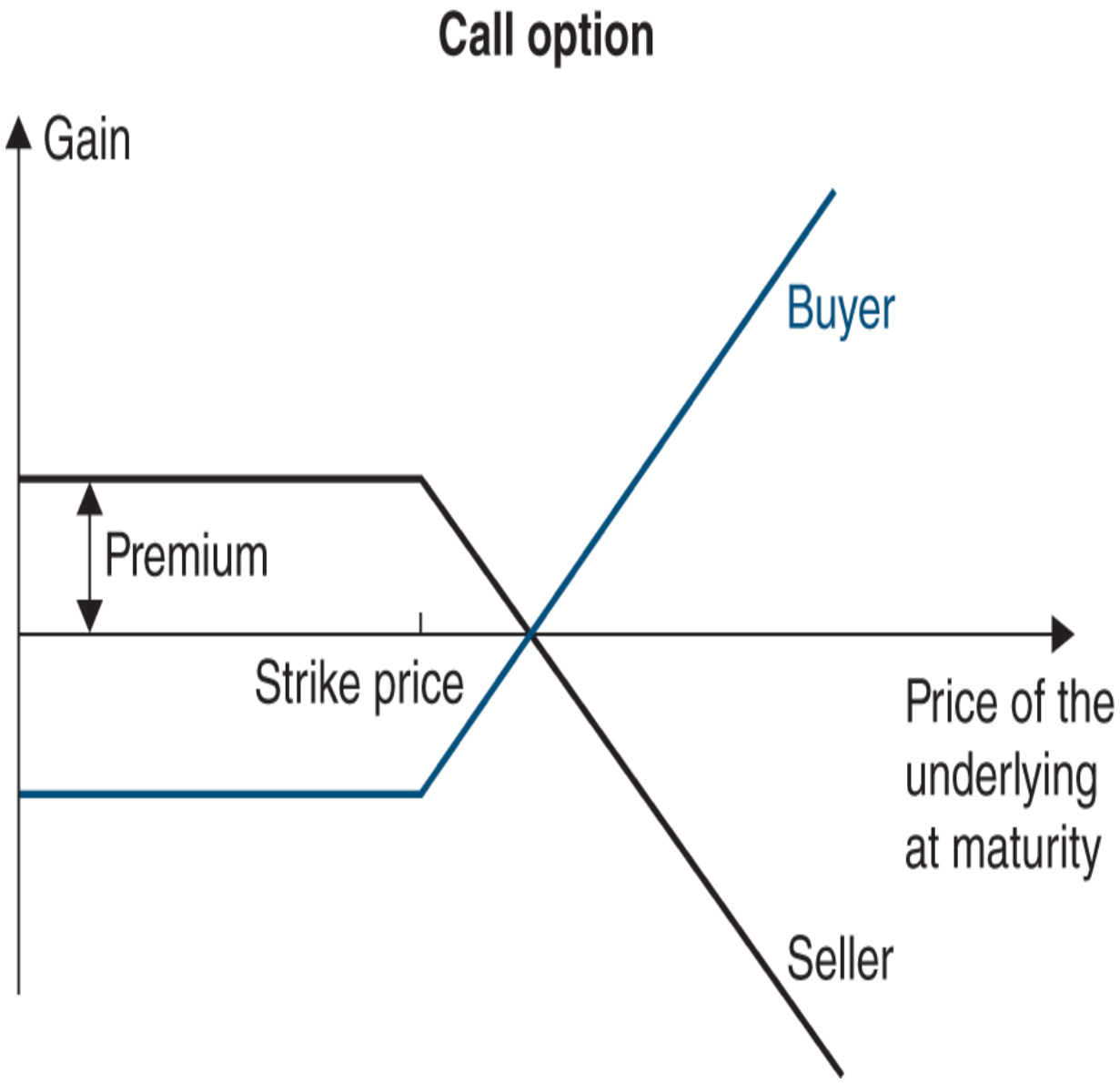
The value at which an option is bought or sold is sometimes called the **premium**. It is obviously paid by the buyer to the seller, who thereby obtains some financial compensation for a situation in which they have all the obligations and no rights.

Hence, a more precise definition of an option would be:

An option is a contract between two sides, under which one side gives the other side the right (but not the obligation) to buy from them (a call option) or to sell to them (a put option) an asset, in exchange for the payment of a premium.

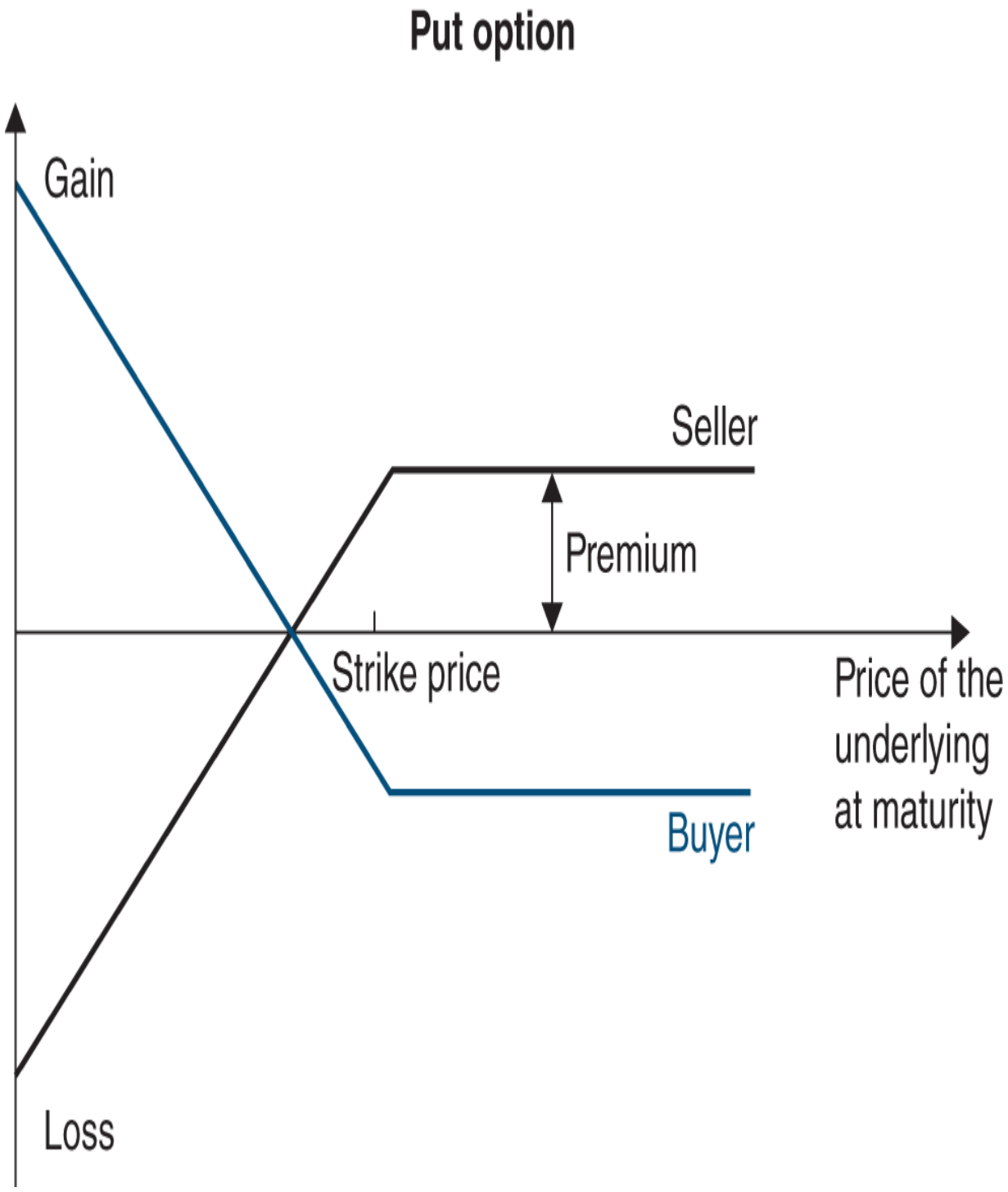
This asset will be bought (or sold) at a predetermined price called the strike price, during a period of time (the exercise period for US-style options) or at a precise date (the exercise date for European-style options).

When the option matures, we can show the payouts for the buyer and the seller of the call option in the following way:



At maturity, if BMW is trading at €90, Helmut will exercise his option and buy his BMW share at €85. He can then sell it again if he wishes, and make €5 in profit (minus the premium he paid for the option).

Similarly, for the put option:



This diagram highlights the **asymmetry of risk** involved: the buyer of the option risks only the premium paid, while his potential profit is almost unlimited, while the seller's gain is limited to the value of the premium received, but his loss is potentially unlimited.

2/ THE THEORETICAL BASIS OF OPTIONS

In a risk-free environment, if we knew today with certainty what would happen tomorrow, options would have no interest.

If the future were known with certainty there would be no risk and all financial assets would bring in the same return, i.e. the risk-free rate. What purpose would an option have, i.e. the right to buy or sell, if we already knew what the price would be at maturity? What purpose would a call option on Siemens serve, at a strike price of €170, if we already knew that Siemens' share price would be below €160 at maturity and that the option would therefore not be exercised? And if we knew that, at maturity, Siemens' share price would be €250, the price of the option would be such that it would offer the risk-free rate, just like Siemens' shares, since the future would be known with certainty.

> Options would not exist if the future were known with certainty. In a risky environment, options remunerate the risk of an uncertain future. The basis of an option is therefore the remuneration of risk.

Options might therefore be called pure financial products, as they are merely remuneration of risk. There is no other basis to the value of an option.

> More generally, all risk premiums are a sort of option.

Section 23.2 MECHANISMS USED IN PRICING OPTIONS

Let's suppose that Felipe buys a call option on Diageo at a £30 strike price, maturing in nine months, and simultaneously sells a put option on the same stock at a £30 strike maturing in nine months. Assuming the funds paid for the call option are largely offset by the funds received for the sale of the put option, what will happen at maturity?

If Diageo is trading at above £30, Felipe will exercise his call option and pay £30. The put option will not be exercised, as his counterparty will prefer to sell Diageo at the market price.

If at maturity Diageo is trading below £30, Felipe will not exercise his call option, but the put option that he sold will be exercised and Felipe will have to buy Diageo at £30.

Hence, regardless of the price of the underlying asset, buying a call option and selling a put option on the same underlying asset, at the same maturity and at the same strike price, is the same thing as a forward purchase of the underlying asset at maturity at the strike price.

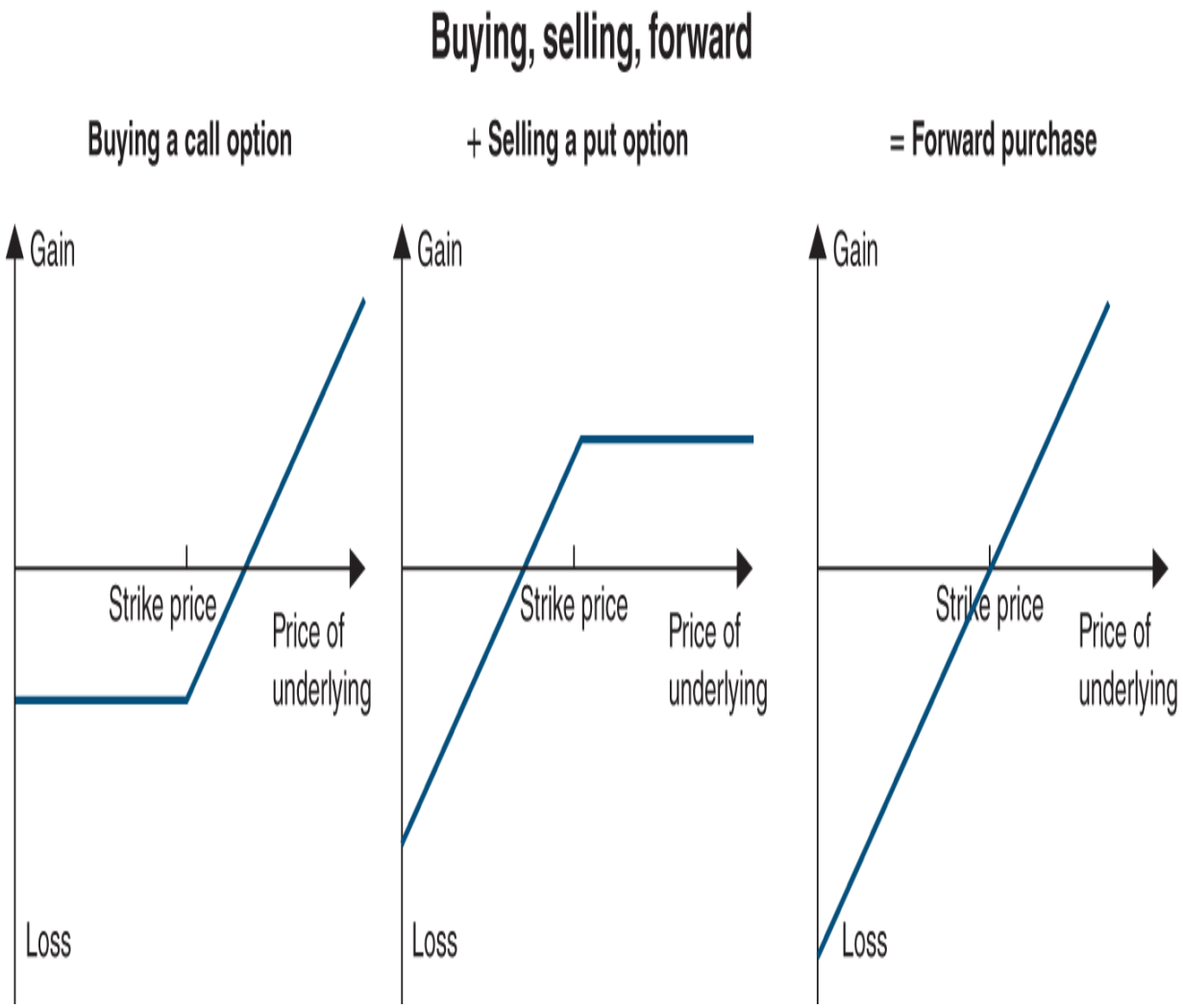
In other words:

> Buying a call option and selling a put option is a forward purchase of the underlying asset;

Assuming fairly valued markets, we can thus deduce that at the end of the exercise period:

> Value at maturity of a call option – value at maturity of a put option = value at maturity of the underlying asset – strike price.
>
> This is the put–call parity.

It looks like this on a chart:



We can see that the profit (or loss) of this combination is indeed equal to the difference between the price of the underlying asset at maturity and the strike price.

Let's now consider the following transaction: Evgueni wants to buy Diageo stock, but does not have the funds necessary at his immediate disposal. However, he will be receiving £30 in nine months, enough to make the purchase. He can thus borrow the present value of £30, nine months out, and buy Diageo.

At maturity, the profit (or loss) on this transaction will thus be equal to the difference between the value of the Diageo shares and the repayment of the £30 loan.

So we are back to the previous case and can thus affirm that in value terms:

Buying a call option and selling a put option on the same underlying asset, at the same strike price and at the same maturity, is like buying the underlying asset by borrowing the present value of the strike price, as long as the two options are European-style options and as long as there is no dividend payout in the interim.

This equation shows that we can “manufacture” a synthetic call option based on a put option and vice versa, as long as we can buy and sell the underlying asset and place or borrow funds.

We have used a stock for the underlying asset, but the above statement applies to any underlying asset (currencies, bonds, raw materials, etc.).

Section 23.3 ANALYSING OPTIONS

1/ INTRINSIC VALUE

Intrinsic value is the difference (if it is positive) between the price of the underlying asset and the call option's strike price. For a put option, it's the opposite. The intrinsic value of a put option is the difference, if positive, between the exercise price of the put option and the price of the underlying asset. And if the difference is not positive, then the intrinsic value is null. In the rest of this chapter, unless otherwise mentioned, we will use call options as examples.

By definition, intrinsic value is never negative.

Let's take a call option on sterling, with a strike price of €1.15/£ and maturing at end-December. Let's say that it is now June and that the pound is trading at €1.26.

What is the option's value? The holder of the option may buy a pound for €1.15, while the pound is currently at €1.26.

This immediate possible gain is none other than the option's intrinsic value, which will be billed by the seller of the option to the buyer. The option will be worth at least €0.11.

Technically, a call option is said to be:

out of the money when the price of the underlying asset is below the strike price (zero intrinsic value);

at the money when the price of the underlying asset is equal to the strike price (zero intrinsic value);

in the money when the price of the underlying asset is above the strike price (positive intrinsic value).

The reader will have understood that a put option is said to be:

out of the money when the price of the underlying asset is above the strike price (zero intrinsic value);

at the money when the price of the underlying asset is equal to the strike price (zero intrinsic value);

in the money when the price of the underlying asset is below the strike price (positive intrinsic value).

2/ TIME VALUE

Now let's say we are in October, sterling is trading at €1.04. The option would be out of the money (€1.04 is less than the €1.15 strike price) and the holder would not exercise it. Does this mean that the option is worthless? No, because there is still a chance, however slight, that sterling will move over €1.15 by the end of December. This would make the option worth exercising. So the option has some value, even though it is not worth exercising right now. This is called **time value**.

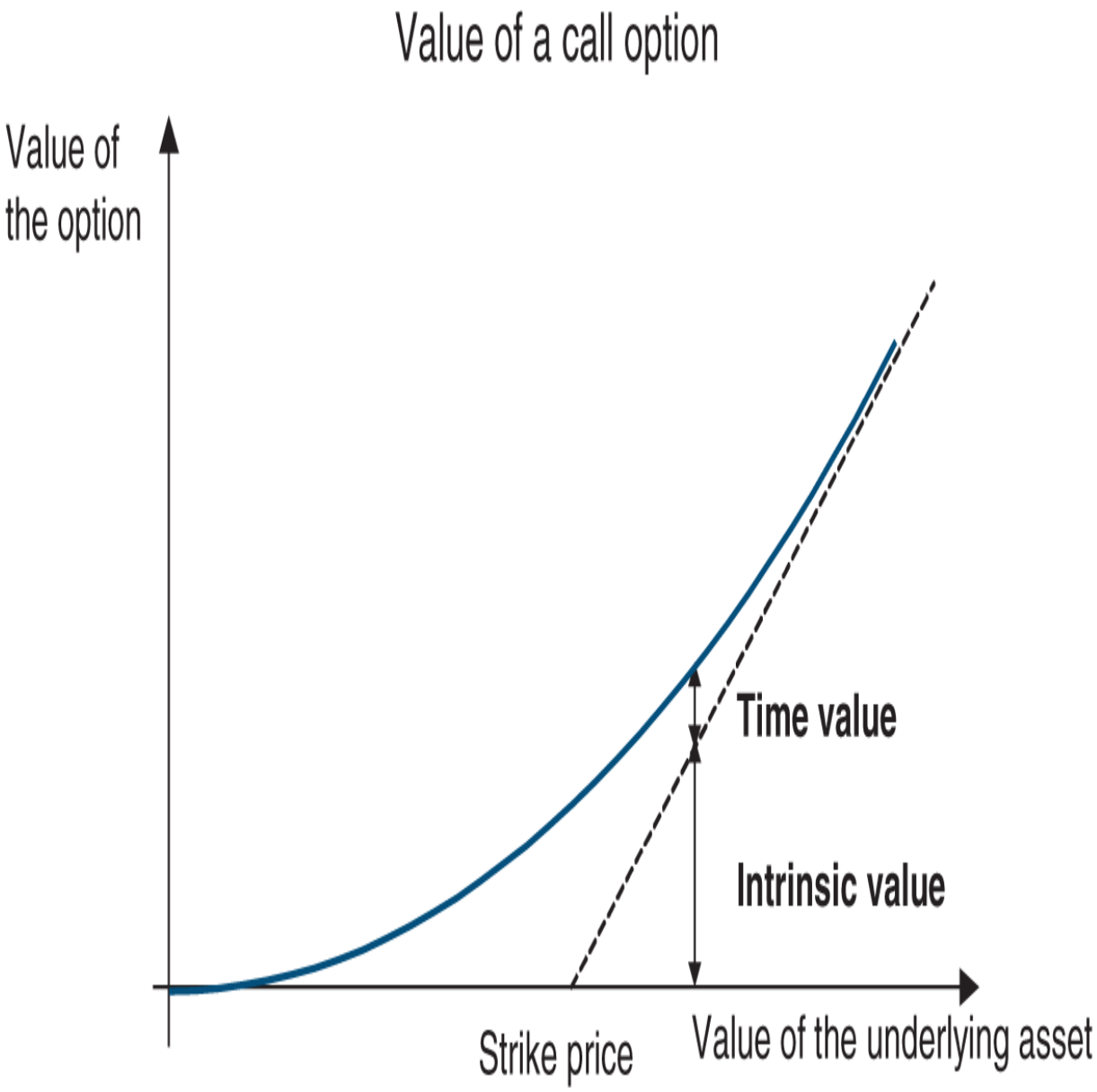
For an in-the-money call option, i.e. whose strike price (€1.15) is below the value of the underlying asset (let's now assume that £1 = €1.27), intrinsic value is €0.12. But this intrinsic value is not all of the option's value. Indeed, we have to add time value, which ultimately is just the anticipation that intrinsic value will be higher than it is currently. For there is always a probability that the price of the underlying asset will rise, thus making it more worthwhile to wait to exercise the option.

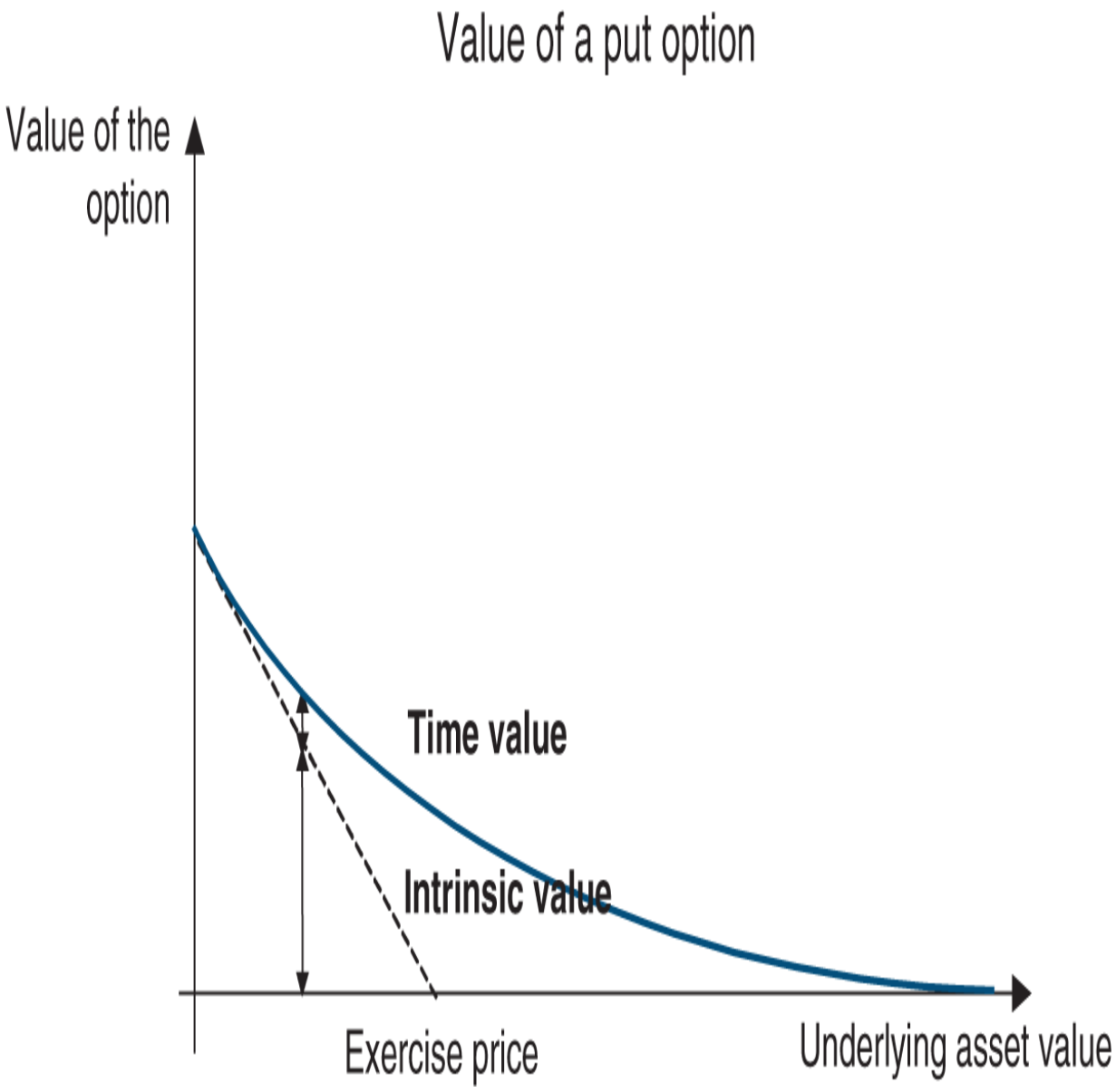
> The anticipation of a greater intrinsic value in the future than the current intrinsic value is called the time value of an option.

In more concrete terms, time value represents “everything that could happen” from now until the option matures.

Hence:

> An option's value = intrinsic value + time value.


Value of a call option
Value of
the option
Time value
Intrinsic value
Strike price
Value of the underlying asset



Time value diminishes with the passage of time, as the closer we get to the maturity date, the less likely it is that the price of the underlying asset will exceed the strike price by that date. Time value vanishes on the date the option expires.

This means that an option is worth at least its intrinsic value, but is there an upper limit on the option's value?

In our example, the value **at maturity** of the call option on sterling is as follows:

If sterling is trading above €1.15, the option is worth the current price of sterling less €1.15, i.e. its intrinsic value, which is below the value of the underlying asset.

If sterling is below or equal to €1.15, the option will be worthless (i.e. no intrinsic value) and therefore even further below the price of the underlying asset.

This means that if the option's value is equal to the price of the underlying asset, then all operators will sell the option to buy the underlying asset, as their gain will be greater in any case.

The value of a call option is always above its intrinsic value, as it possesses time value, but it is always below the value of the underlying asset.

Section 23.4 PARAMETERS TO VALUE OPTIONS

There are six criteria for determining the value of an option. We have already discussed one of them, the price of the underlying asset. The other five are:

the strike price;

the volatility of the underlying asset;

the option's maturity;

the risk-free rate;

the dividend or coupon, if the underlying asset pays one out.

1/ PRICE OF THE UNDERLYING ASSET

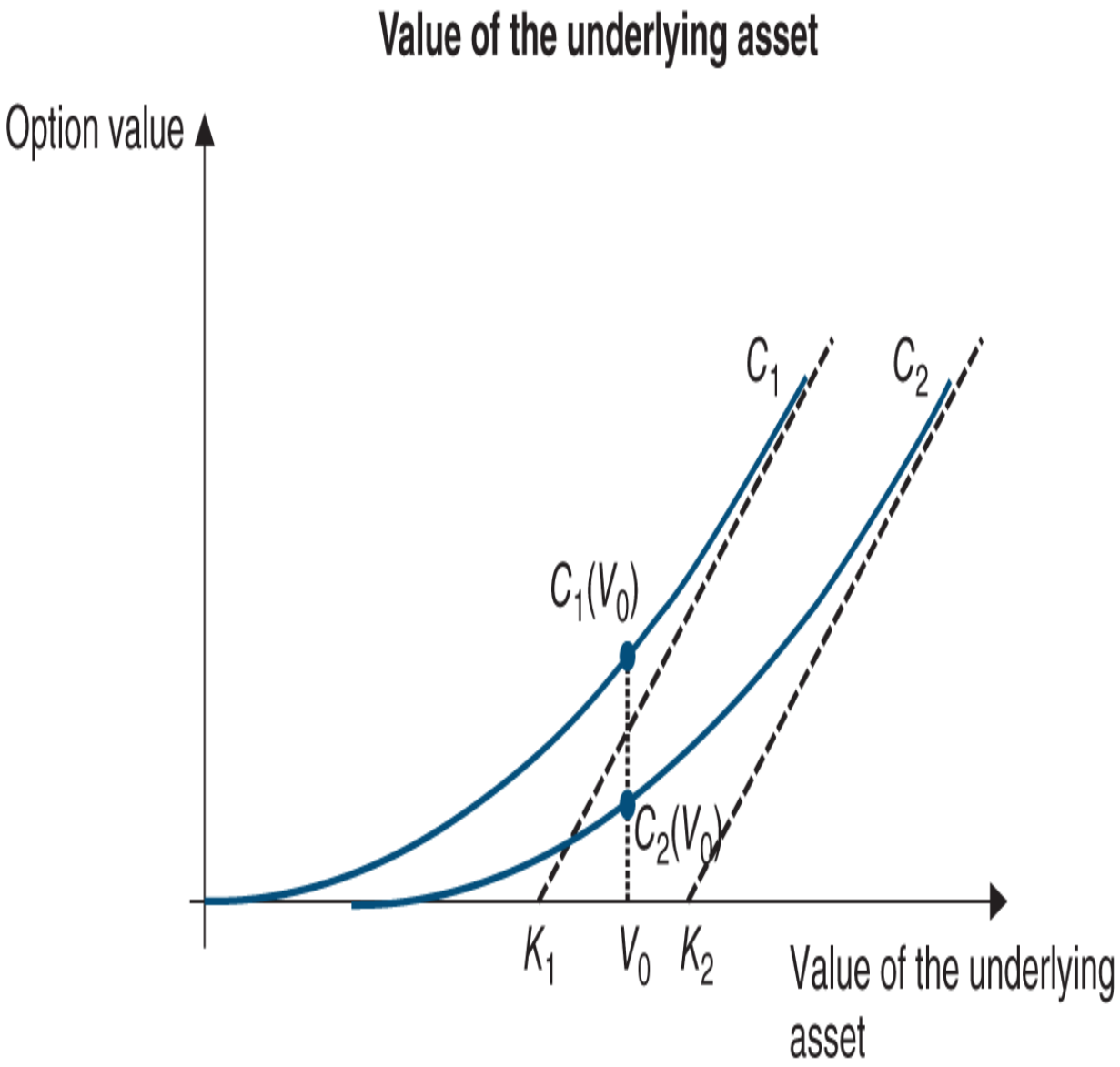
As we saw earlier, all other criteria being equal, the value of a call option will be higher with a higher price of the underlying asset.

Symmetrically, the value of a put option will be lower with a higher price of the underlying asset.

2/ STRIKE PRICE

> Assuming the same value of the underlying asset, the higher the strike price, the lower the value of a call option.
>
> Hence, and again assuming the same value for the underlying asset, the higher the strike price, the greater the value of a put option.

This is just common sense: the higher a call option's strike price, the less chance the price of the underlying asset will exceed it. It is thus normal that the value of this call option is lower. However, the price of the put option will rise as the underlying asset can be sold at a higher price.



For the same value of the underlying asset, the value of a call option varies in the opposite direction to the strike price. The value of C_2 is less than that of C_1 as its exercise price is higher ($K_2 > K_1$)

3/ VOLATILITY IN THE VALUE OF THE UNDERLYING ASSET

The value of both a call and a put option rises with the volatility in the value of the underlying asset.

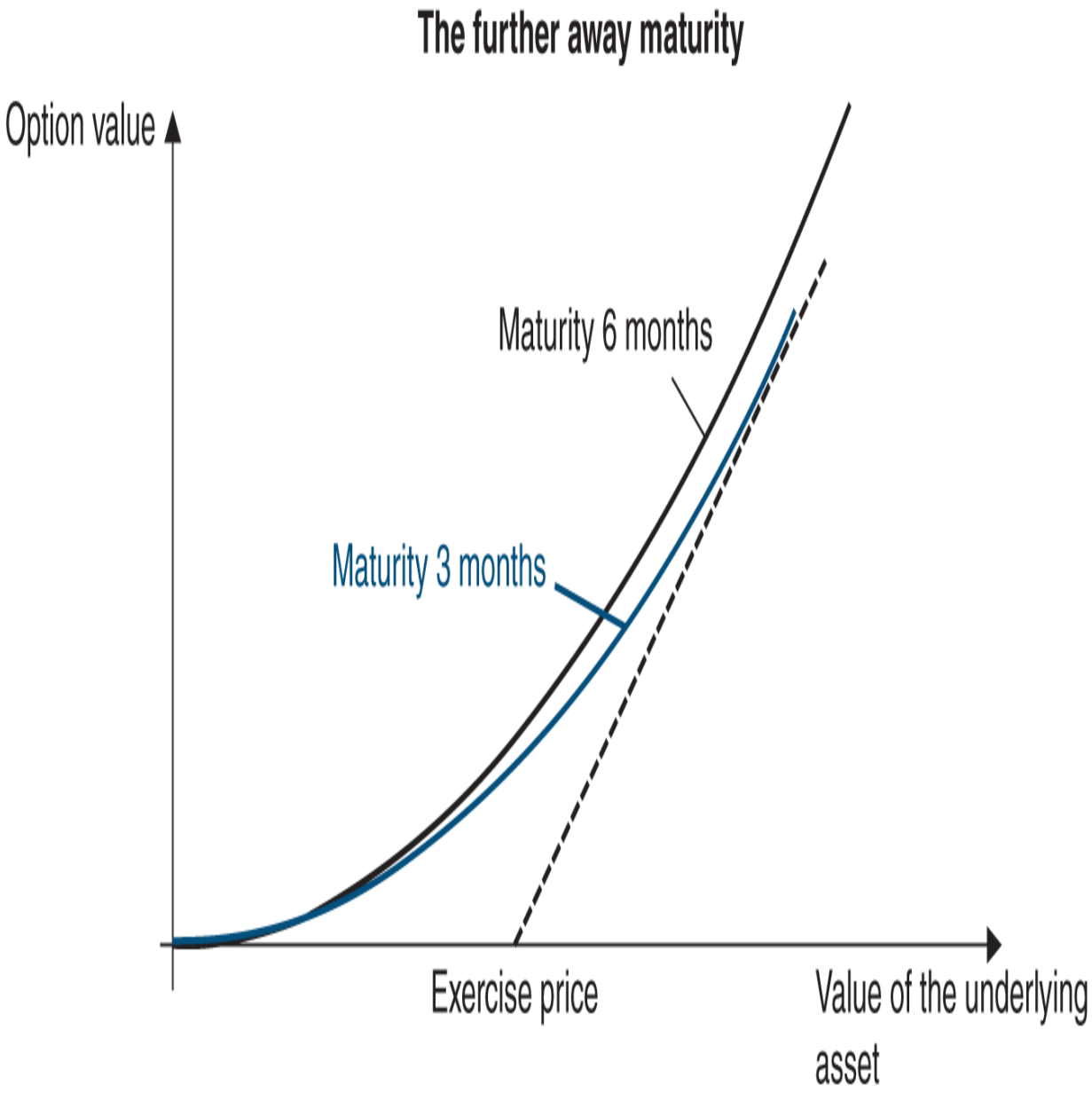
Here again, this is easy to understand: the more volatile the underlying asset, the more likely it is to rise and fall sharply. In the first case, the return will be greater for the holder of a call option; in the second case, it will be greater for the holder of a put option. As an option is nothing more than pure remuneration of risk, the greater that risk is, the greater the remuneration must be, and thus the option's value.

Time value rises with the volatility of assets.

4/ THE TIME TO MATURITY

The further away maturity is, the greater the value of both a call and a put option.

You can easily see that the further away maturity is, the greater the likelihood of fluctuations in the price of the underlying asset. This raises the option's value.



The further away maturity is, the greater time value is.

5/ THE RISK-FREE RATE

The buyer of the call option pays the premium, but pays the strike price only when exercising the option. Everything happens as if she was buying on credit until “delivery”. Consequently, the further away the maturity date on an option, the further away the payment of the acquisition price of the underlying asset. The holder of a call (put) option will thus have a cash advantage (disadvantage) that depends on the level of the risk-free rate.

> All other things being equal, the value of a call option increases with the risk-free rate, while the value of a put option is an inverse function of the risk-free rate.

Interest rates have much less influence on the value of an option than the other five factors.

6/ DIVIDENDS OR COUPONS

When the underlying asset is a stock or bond, the payment of a dividend or coupon lowers the value of the underlying asset. It thus lowers the value of a call option and raises the value of a put option. This is why some investors prefer to exercise their calls (on US-style options) before the payment of the dividend or coupon.

We can summarise the change in price of the option depending on the change in criterion in the following table:

Criterion		Call	Put
Price of the underlying asset	↗	↗	↘
	↘	↘	↗
Strike price	↗	↘	↗
	↘	↗	↘
Volatility of the underlying asset	↗	↗	↗
	↘	↘	↘
Option's maturity	↗	↗	↗
	↘	↘	↘
The risk-free rate	↗	↗	↘
	↘	↘	↗
Dividend or coupon	↗	↘	↗
	↘	↗	↘

Section 23.5 METHODS FOR PRICING OPTIONS

1/ REASONING IN TERMS OF ARBITRAGE (BINOMIAL METHOD)

To model the value of an option, we cannot use discounting of future cash flow at the required rate of return as we have for other financial securities, because of the risk involved. Cash flow depends on whether or not the option will be exercised and the risk varies constantly. Hence, the further the option is into the money, the higher its intrinsic value and the less risky it is.

Cox *et al*. (1979) thus had the idea of using arbitrage logic in comparing the profit generated with options, with a direct position on the underlying asset.

Let's take the example of a call option with a €105 strike price on a given stock (currently trading at €100) and for a given maturity.

Let's also assume that there are only two possibilities at the end of this period: either the stock is at €90 or it is at €110. At maturity, our option will be worth its intrinsic value, i.e. either €0 or €5, or €0 or €20 if we held four options, for example, instead of just one.

We can try to obtain the same result (€0 or €20) in the same conditions using another combination of securities (a so-called **replicating portfolio**). If we achieve this result, the portfolio of four call options and this other combination of securities should have the same value. If we can determine the value of this other combination of securities, we will have succeeded in valuing the call option.

To do so, let's say you borrow (at 5%, for example) a sum whose value (principal and interest) will be €90 at the end of the period concerned, and then buy a share for €100 today.

At the end of the period:

either the share is worth €110, in which case the combination of buying the share and borrowing money is worth €110 − €90 = €20; or

the share is worth €90, in which case the replicating portfolio is worth 90 − 90 = 0.

Since the two combinations – the purchase of four call options on the one hand, and borrowing funds and buying the share directly on the other hand – produce the same cash flows, regardless of what happens to the share price, their values are identical. Otherwise, arbitrage traders would quickly intervene to re-establish the balance. So what is the original value of this combination? Let's look at it this way: €14.3 corresponds also to the value of the four call options. We thus deduce that the call option at a €105 strike is worth €3.58. We have valued the option using arbitrage theory.

Purchase of a share: €100

– Borrowing of a sum that at maturity would be worth €90, hence, at 5%, 90 / 1.05

= €85.7

= Value: €14.3

“Delta” is the number of shares that must be bought to duplicate an option. In our example, four calls produce a profit equivalent to the purchase of one share. The option's delta is therefore 1/4, or 0.25.

More generally, delta is defined as the ratio between the variation in the option's value, and the variation in the price of the underlying asset.

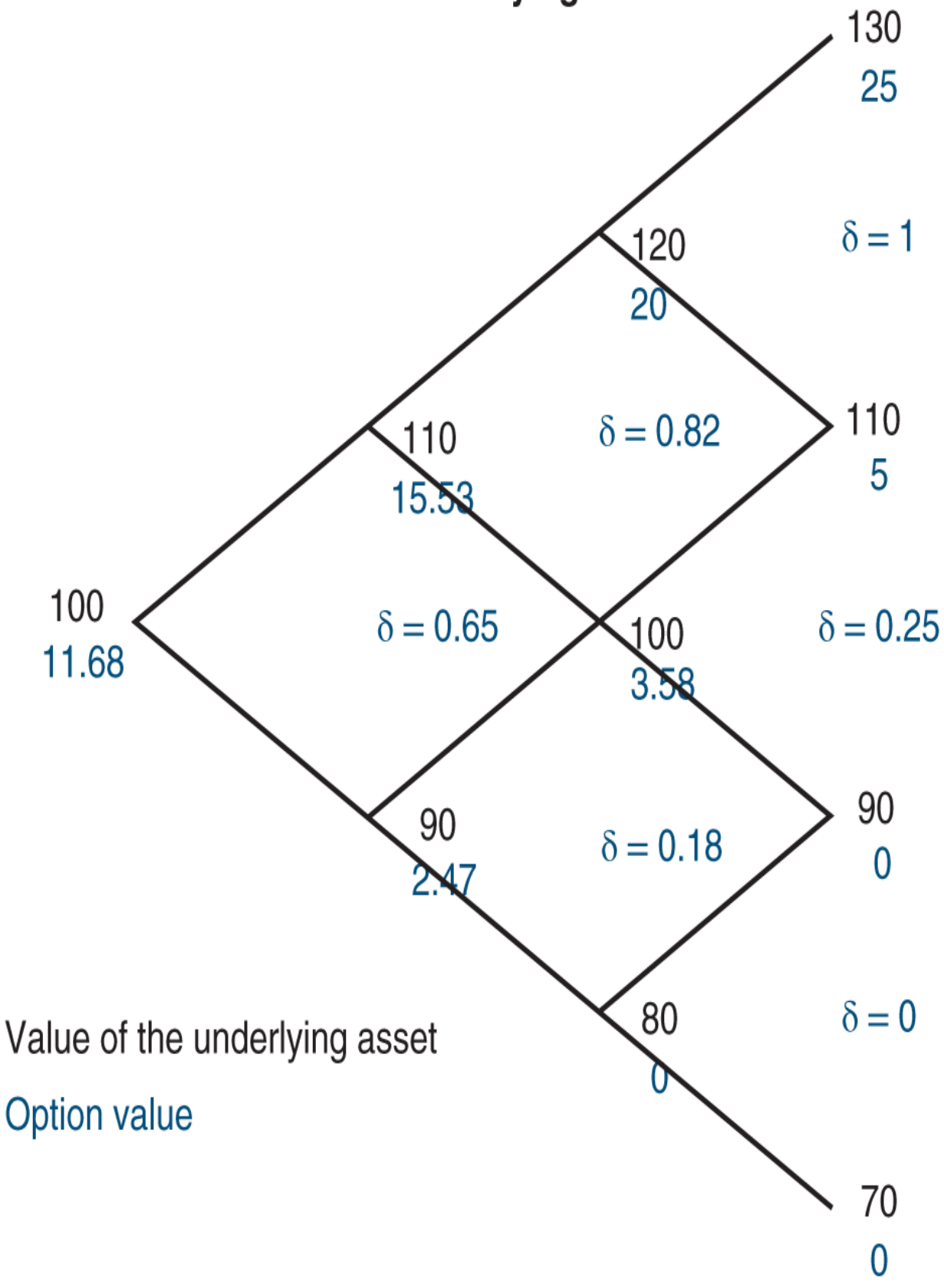
Hence:

$$\delta = \frac{5 - 0}{110 - 90} = 0.25$$

Our example above obviously oversimplifies in assuming that the underlying asset can only have two values at the end of the period. However, now that we have understood the mechanism, we can go ahead and reproduce the model in backing up two periods (and not just one) before the option matures. This is called the binomial method, because there

are two possible states at each step. By multiplying the number of periods or dividing each period into sub-periods, we can obtain a very large number of very small sub-periods until we have a very large number of values for the stock at the option's maturity date, which is more realistic than the simplified schema that we developed above.

Here is what it looks like graphically:


Value of underlying asset
130
25
120
20
δ = 1
110
15.53
δ = 0.82
110
5
100
11.68
δ = 0.65
100
3.58
δ = 0.25
90
2.47
δ = 0.18
90
0
80
0
δ = 0
70
0
Value of the underlying asset
Option value

2/ THE BLACK–SCHOLES MODEL

In a now famous article, Fisher Black and Myron Scholes (1972) presented a model for pricing European-style options that is now very widely used. It is based on the construction of a portfolio composed of the underlying asset and a certain number of options such that the portfolio is insensitive to fluctuations in the price of the underlying asset. It can therefore return only the risk-free rate.

The Black–Scholes model is the continuous-time (the period approaches 0) version of the discrete-time binomial model. The model calculates the possible prices for the underlying asset at maturity, as well as their respective probabilities of occurrence, based on the fundamental assumption that this is a random variable with a log-normal distribution.

For a call option, the Black–Scholes formula is as follows:

$$\text{Value of the call option} = N(d_1) \times V - N(d_2) \times K \times e^{-T \times r_F}$$

with:

$$d_1 = \frac{\ln\left(\frac{V}{K}\right) + \left(r_F + \frac{\sigma^2}{2}\right) \times T}{\sigma \times \sqrt{T}} \quad \text{and} \quad d_2 = d_1 - \sigma \times \sqrt{T}$$

where V is the current price of the underlying asset, $N(d)$ is a cumulative standard normal distribution (average = 0, standard deviation = 1), K is the option's strike price, e is the exponential function, r_F is the continual annual risk-free rate, s the instantaneous standard deviation of the return on the underlying asset, T the time remaining until maturity (in years) and ln the Naperian logarithm.

In practice, the instantaneous return is equal to the difference between the logarithm of the share price today and yesterday's share price:

$$r = \ln V_1 - \ln V_0$$

To cite an example: the value of a European-style nine-month call, with a strike price of €100, share price today of €90, a 3.2% risk-free rate and a

20% standard deviation of instantaneous return, is €3.3.

The formula for valuing the put option is as follows:

$$\text{Value of the put option} = N(-d_2) \times K \times e^{-T \times r_F} - N(-d_1) \times V$$

The reader should notice that $N(d_1)$ is the option's delta, while $K \times e^{-T \times r_F}$ represents the present value of the strike price.

Hence:

$$\text{Call option's value} = V \times \delta - N(d_2) \times \text{Present value of the strike price}$$

The Black–Scholes model was initially designed for European-style stock options. The developers of the model used the following assumptions:

no dividend or coupon payout throughout the option's life;

constant volatility in the underlying asset over the life of the option, as well as the interest rate;

liquidity of the underlying asset so that it can be bought and sold continuously, with no intermediation costs;

that market participants behave rationally!

More complex models have been derived from Black and Scholes to surmount these practical constraints. The main ones are those of Garman and Kohlhagen (1983) for currency options and Merton (1976), which reflects the impact of the payment of a coupon during the life of a European-style option.

US-style options are more difficult to analyse and depend on whether or not the underlying share pays out a dividend:

If the share pays no dividend, then the holder of the option has no reason to exercise it before it matures. They will sell their option rather than exercise it, as exercising it will make it lose its time value. In this case, the value of the US-style call option is thus identical to the value of a European-style call option.

If the share does pay a dividend, then the holder of the call may find it worthwhile to exercise their option the day before the dividend is paid. To determine the precise value of such an option, we have to use an iterative method requiring some calculations developed by Roll (1977). However, we can simplify for a European-style call option on an underlying share that pays a dividend: the Black–Scholes model is applied to the share price minus the discounted dividend.

Of the six criteria of an option's value, five are “given” (price of the underlying asset, strike price, maturity date, risk-free rate and, where applicable, dividend); only one is unknown: volatility.

From a theoretical point of view, the volatility should be the anticipated volatility and it would have to be constant for the Black–Scholes model to be applied. In practice, this is rarely the case: market operators adjust upward and downward the historical volatility that they calculated (over 20 days, one month, six months, etc.) to reflect their anticipation of the future stability or instability of the underlying asset. However, several classes of options (same underlying, different maturity or strike price) can be listed for the same underlying asset. This allows us to observe the implied volatility of their quoted prices and thus value the options of another class.

This is how anticipated volatility is obtained and is used to value options. This practice is so entrenched that options market traders trade anticipation of volatility directly.

Anticipated volatility is then applied to models to calculate the value of the premium.

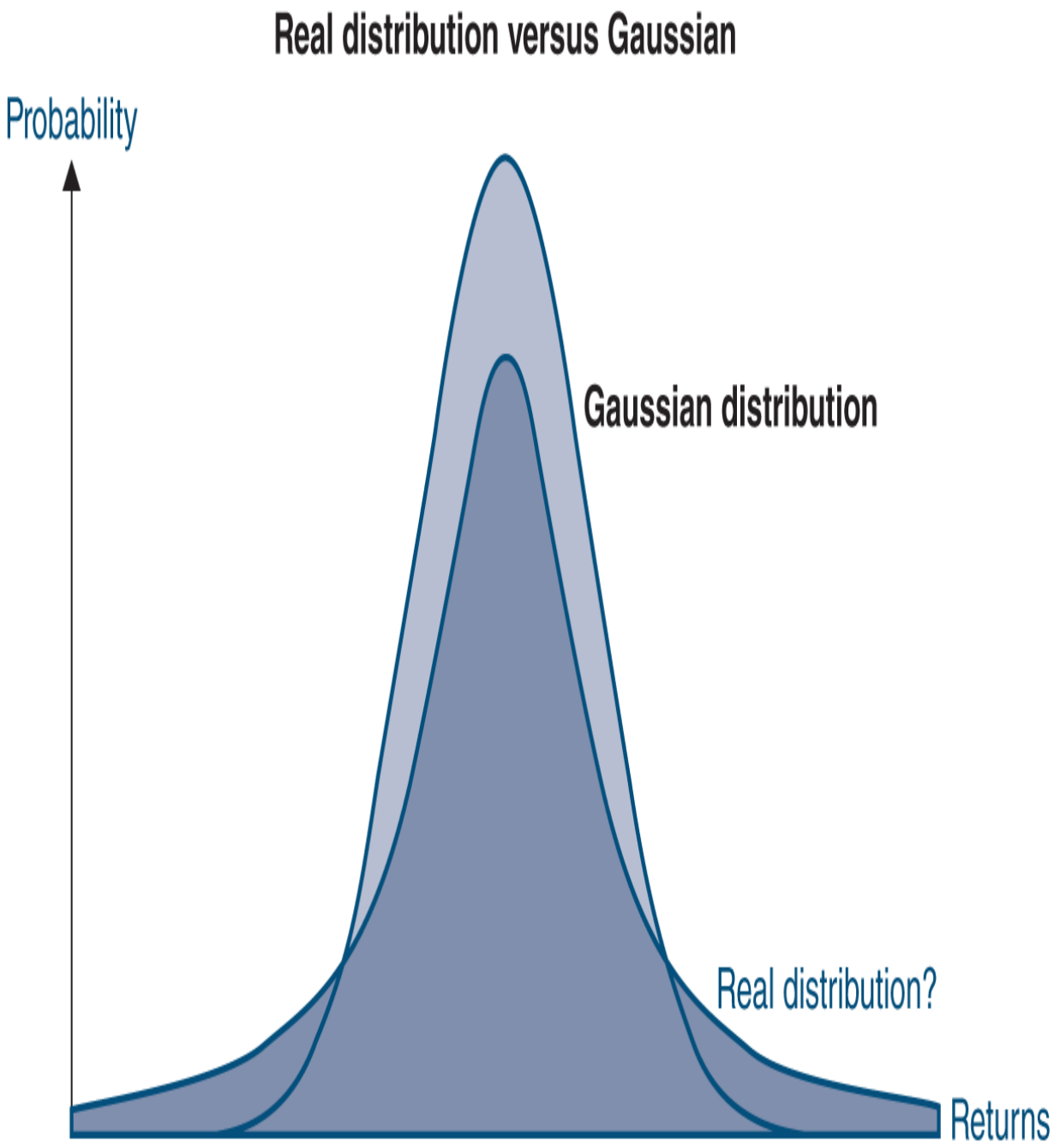
The Black–Scholes model can thus be used “backwards”, i.e. by taking the option's market price as a given and calculating implied volatility. The operator can then price options by tweaking the price on the basis of their own anticipation. They buy options whose volatility looks too low and sell those whose implied volatility looks too high.

It is interesting to note that, despite these simplifying assumptions, the Black–Scholes model has been de facto adopted by market operators, each of them adapting it to the underlying asset concerned.

3/ MODEL RISK

Options markets, whether organised (listed) or not (over-the-counter), have developed considerably since the mid-1970s, as a result of the need for hedging (of currency risks, interest rates, share prices, etc.), an appetite for speculation (an option allows its holder to take a position without having to advance big sums) and the increase in arbitrage trading.

In these conditions, a new type of approach to risk has developed on trading floors: model risk. The notion of model risk arose when some researchers noticed that the Black–Scholes model was biased, since (like many other models) it models share prices on the basis of a log-normal distribution. We have seen empirically that this type of distribution significantly minimises the impact of extreme price swings.



If returns actually followed a Gaussian distribution, the Dow Jones would change daily by more than 7% only once in 300,000 years. In the 20th century there were 53 such changes, and there have been 5 in 2020!

To simplify, we can say that the Black–Scholes model does not reflect the risk of a market crash.

This has given rise to the notion of model risk, as almost all banks use the Black–Scholes model (or a model derived from it). Financial research has uncovered risks that had hitherto been ignored.

An anomaly in the options market highlights the problems of the Black–Scholes model. When we determine the implied volatility of an underlying asset (the only factor not likely to be observed directly) based on the price of various options having the same underlying asset, we can see that we do not find a single figure. Hence, the implied volatility on options far out-of-the-money or far in-the-money is higher than the implied volatility recalculated on the basis of at-the-money options. This phenomenon is called the volatility smile (because when we draw volatility on a chart as a function of strike price, it looks like a smile).

Section 23.6 TOOLS FOR MANAGING AN OPTIONS POSITION

Managing a portfolio of options (which can also be composed of underlying assets or the risk-free asset) requires some knowledge of four parameters of sensitivity that help us measure precisely the risks assumed and develop speculative, hedging and arbitrage strategies.

1/ THE IMPACT OF FLUCTUATIONS IN THE UNDERLYING ASSET: DELTA AND GAMMA

We have already discussed the delta, which measures the sensitivity of an option's value to fluctuations in the value of the underlying asset. For calls and puts that are significantly out of the money, the value of the option may not change much when the underlying asset moves up or down. As the price of the underlying asset moves to a level substantially above the strike for calls or below the strike for puts, the option becomes more valuable and more sensitive to changes in the underlying asset.

Mathematically, the delta is derived from the option's theoretical value vis-à-vis the price of the underlying asset and is thus always between 0 and 1, either positive or negative. Whether it is positive or negative depends on the type of option.

> The delta of a call option is positive, since an increase in the price of the underlying asset increases the option's value.
>
> The delta of a put option is negative, since an increase in the price of the underlying asset lowers the option's value.

We have seen that, when using the Black–Scholes formula, the delta of a call option is equal to $N(d_1)$. The delta of a put option is equal to $N(d_1) - 1$. This relationship is prized by managers of options portfolios, as it links the option's value and the value of the underlying asset directly. Indeed, we have seen that the delta is, above all, an underlying equivalent: a delta of 0.25 tells us that a share is equivalent to 4 options. But above all, managers

use the delta as an indicator of sensitivity: how much does the option's value vary in euros when the underlying asset varies by one euro?

The delta of a call option that is far in-the-money is very close to 1, as any variation in the underlying asset will show up directly in the option's value, which is essentially made up of intrinsic value.

Similarly, a call option that is far out-of-the-money is composed solely of its time value and a variation in the underlying asset has little influence on its value. Its delta is thus close to 0.

The delta of an at-the-money call option is close to 0.5, indicating that the option has as much chance as not of being exercised.

This is expressed in the following table:

	Out-of-the-money	**At-the-money**	**In-the-money**
Call option	$0 < \text{delta} < 0.5$	$\text{delta} = 0.5$	$0.5 < \text{delta} < 1$
Put option	$-0.5 < \text{delta} < 0$	$\text{delta} = -0.5$	$-1 < \text{delta} < -0.5$

The delta can also express probability of expiration in-the-money for options close to maturity and whose underlying asset is not too volatile: a delta of 0.80 means that there is an 80% probability that the option will expire in-the-money.

Unfortunately, the delta itself varies with fluctuations in the underlying asset and with the passing of time. Changes in the delta of an option create either a risk or an opportunity for investors and traders. Hence, the idea of measuring the sensitivity of delta to variations in the value of the underlying asset: this is what gamma does. Mathematically, it is none other than a derivative of the delta vis-à-vis the underlying asset, and is often called the delta of the delta!

The gamma of an option is largest near the strike price. A zero-gamma options position is completely immune to fluctuations in the value of the underlying asset.

2/ THE IMPACT OF TIME: THETA

Options are like people: they run down with time. Even if there is no change in the underlying asset price, the passage of time alone shows up in

gains or losses for the option's holder as a result of the decrease in the time value of the option.

Mathematically speaking, the theta is equal to the opposite of the derivative of the theoretical value of the option with respect to time. Theta measures how much an option loses in value if no other factors change.

3/ THE IMPACT OF VOLATILITY: VEGA

Vega is the derivative of the theoretical value of the option with respect to implied volatility. Vega is always positive for a call option, as for a put option, as we have seen that the time value of an option is an increasing function of volatility.

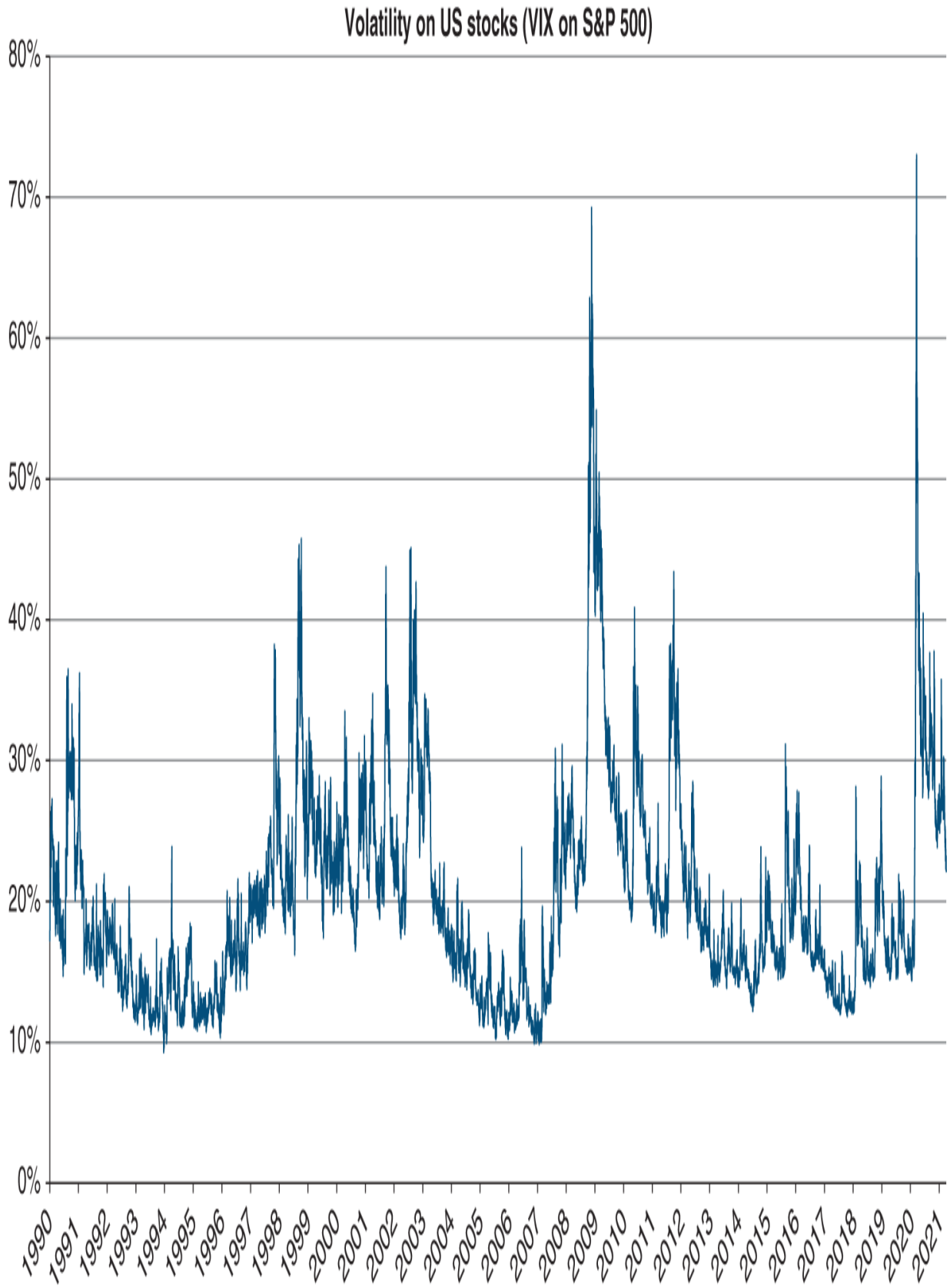
All other factors being equal, the closer an option is to being in the money (with maximum time value), the greater the impact of an increase in volatility.

While each of the tools presented here is highly useful in and of itself, combining them tells us even more. In practice, it is impossible to create a position that is neutral on all criteria at once. No return is possible when taking no risk. No pain, no gain! Hence, a delta-neutral position and a gamma-negative position must necessarily have a positive theta in order to be profitable.

4/ IMPLIED VOLATILITY

From 1990, the CBOE (Chicago Board Options Exchange) has calculated the VIX, an index of the implied volatility of the Standard & Poor's 100, using at-the-money options with a maturity shorter than one month. The options on the S&P 100 are sufficiently liquid to consider this index representative of the implied volatility on the market.

The following graph shows the evolution of VIX from its initial launch.


Volatility on US stocks (VIX on S&P 500)
80%
70%
60%
50%
40%
30%
20%
10%
0%
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021

Source: Data from FactSet, Bloomberg & Datastream

We will see in the following chapters the many applications of options in corporate finance:

to raise financing (see Chapter 25);

to resolve conflicts between management and ownership or between ownership and lenders (see Chapter 34);

to hedge risks and invest (see Chapter 51);

to choose investments (see Chapter 30);

to value assets (see Chapter 31);

to value the equity of a company (see Chapter 34);

to take over a company (see Chapter 45).

This gives you an idea of the importance of options.

SUMMARY

The summary of this chapter can be downloaded from www.vernimmen.com.

Options are very useful financial products to analyse complex corporate finance problems. You will soon see that the number of ways in which they can be used are numerous! That is why this chapter is so important.

An option is a contract between two sides, under which one side gives the other the right (but not the obligation) to buy from them (a call option) or sell to them (a put option) an asset, in exchange for the payment of a premium. This asset will be bought (or sold) at a predetermined price called the strike price, during a period of time (the exercise period for US-style options) or at a precise date (the exercise date for European-style options). The basis of an option is the remuneration of risk. The option cannot exist in a risk-free environment and it thrives on risk.

The value of an option (call or put) can be broken down into an intrinsic value and a time value. The intrinsic value is the difference between the price of the underlying asset and the option's strike price. It can only be zero or positive. The time value is the premium on the intrinsic value, which remunerates the time left until expiry of the option.

There are six criteria for determining the value of an option:

the price of the underlying asset;

the strike price;

the volatility of the underlying asset;

the option's maturity;

the risk-free rate; and, if applicable,

the dividend or coupon if the underlying asset is a share or a bond that pays one or the other during the life of the option.

Models have been developed for valuing options, the main ones being the Black–Scholes and binomial models. They have been adapted over time to make them less restrictive and capable of factoring in specific features.

QUESTIONS

1/Define a call or put option.

2/What are the six criteria for determining the value of an option?

3/What does the delta of an option indicate?

4/What impact will a rise in volatility have on the value of a call option? And a drop in interest rates? And payment of a dividend? And the extension of the maturity of an option? And an upward revision of the strike price? And on the value of a put option?

5/Can you set the sale of a call option off against the purchase of a put option on the same underlying asset at the same maturity?

6/How would this investor find counterparties?

7/Show how, in the end, the investor always pays too much for the option. Why is this statement absurd?

8/Of the following four transactions, which carries the most risk:

purchase of a call option;

sale of a call option;

purchase of a put option;

sale of a put option?

Why?

9/Time value is the anticipation of intrinsic value being stronger than it is now. However, intrinsic value can drop. Why, then, can time value not be negative?

10/In concrete terms, what does the difficulty in valuing an option boil down to?

11/Why are options particularly well suited to arbitrage strategies? And speculation?

12/Show how the purchase of an option and the sale of another option can protect you against the risk of a drop in the value of the underlying share without costing you anything if you give up the profit on a possible rise in the value of the underlying asset over a given threshold.

13/If you hold stock options on the shares in your company, would you be pleased to see the company paying out large dividends? Why?

14/In your view, what is the main contribution of the Black–Scholes model?

15/Why do option pricing models have difficulty taking into account the frequency of extreme events?

16/What is the time value of an option on the risk-free asset which, in the current context, yields 0%?

You'll find more questions at www.vernimmen.com.

EXERCISES

1/The Konzerthaus in Berlin sells tickets known as *Nacheinlasskarten*, 30 minutes before the start of every concert that has been sold out.

Buyers of these tickets wait at the doors giving access to the various categories of seats in the concert hall. Thirty seconds before the concert starts, they are allowed in and can occupy any free seat. If there are no free seats they have to leave the hall and are not allowed to try again for a different category of seat (in any event, the conductor has already raised his baton). If the legitimate ticket holder for the seat arrives before the concert starts, the holder of the *Nacheinlasskart* must give up their seat and leave the hall.

What is your view of this type of ticket? Be as specific as possible. Careful! This is a lot more complicated than you probably think it is.

2/You wish to value a call option on Google shares (which do not pay dividends) with a strike price of $800 and a six-month duration. You do not know what volatility to factor in. Fortunately, four-month options are listed at $40 for a strike price of $830. What is the implied volatility of these options? The interest rate is 3% and Google shares are trading at $800. What is the value of this first option?

3/Redo the exercise above, assuming in the first case that Google shares rise to $900 or fall to $650. What is the impact on the value of the option? What basic feature of the option have you highlighted?

ANSWERS

Questions

1/*An option is a promise to buy for a call and to sell for a put.*

2/*The strike price, the value of the underlying share, volatility, the interest rate, the maturity of the option and any dividend or coupon.*

3/*The hedge ratio and the probability that the option will expire in the money.*

4/*Rise, fall, fall, rise, fall. Rise, rise, rise, rise, rise.*

5/*No. The position obtained in this way would correspond to the sale, on maturity of the option, of the underlying asset.*

6/*By going onto the futures market.*

7/*The premium includes a time value that becomes zero when the option is exercised or expires. Because nobody knows the future with certainty.*

8/*Sale of a call option (unlimited losses as the potential value of the asset is unlimited). The sale of a put option is also very risky (but the loss is limited to the value of the underlying share minus the strike price).*

9/*Because, in this case, the value of the option would be lower than the intrinsic value, resulting automatically in arbitrage (purchase of the option, exercise of the option, sale of the underlying share obtained).*

10/*Determining the volatility to be used.*

11/*Because, by combining them, you can reconstitute an underlying asset; as a result of their strong leverage effect.*

12/*Sale of a call option with a strike price of 120, and using the price obtained on this option to purchase a put option at, say, 100. You will then be protected against a drop below 100, but will not benefit from a rise above 120.*

13/*No, not at all, as this would reduce the value of the stock options.*

14/*The method for calculating the value of conditional assets, which enabled the "industrialisation" of options.*

15/*Because they are based on lognormal laws whose distribution tails are too fine compared to reality.*

16/*Nothing if the asset is truly risk-free, i.e. without fluctuation in value.*

Exercises

A detailed Excel version of the solutions is available at www.vernimmen.com.

1/*This is a call option at a zero strike price combined with a put option at a zero strike price, the value of which depends on how many people arrive in time for the concert.*

2/*27%, $66.2.*

3/*$134.8, $11.0, the risk! Because a 13% rise in the value of Google's share will lead to a 103% rise in the value of the option, and a 19% drop in the value of the share will lead to an 83% fall in the value of the option.*

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Chapter 24
HYBRID SECURITIES

It's a kind of magic

Before we begin the study of these different products, we caution the reader to bear in mind the following points:

Some types of securities offer a lower interest rate in exchange for other advantages to the holder, and therefore give the impression of lowering the cost of financing to the company. It is an error to think this way. **In markets in equilibrium, all sources of financing have the same cost if one adjusts for the risk borne by the investor.**

To know whether a source of financing is cheap or dear, one must look past the apparent cost to the overall valuation of the financing. **Only if securities have been issued at prices higher than market value can one say that the cost of financing is indeed lower.**

With the exception of products that exactly match a particular market demand, sophisticated hybrid securities are costly to issue and sell. As such, they are a signal to investors that the company, or its majority shareholder, is having trouble attracting investors, perhaps because it is experiencing other difficulties.

By emphasising the fundamental asymmetry of information between issuer and investor, agency theory and signalling theory are both very useful for explaining the appeal of products of this kind.

Lastly, it must not be forgotten that corporate finance is not immune to fashion. Investors have a great appetite for novelty, especially if it gives them the feeling of doing high finance!

Section 24.1 WARRANTS

1/ DEFINITION

A **warrant** is a security that allows the holder to subscribe to another newly issued security (share, bond or even another warrant) during a given period, in a proportion and at a price fixed in advance.

Subscription warrants may be attached to an issue of shares or bonds, in which case the issue is said to be one of “shares cum warrants” or “bonds cum warrants” or “convertible bonds cum warrants”. Attached warrants to buy shares may be called an “equity sweetener” or “equity kicker”. Warrants can also be issued and distributed to existing shareholders at no charge. Once securities with attached warrants have been issued, the whole is split into its two component parts: the shares or bonds become traditional securities and the warrants take on a life of their own. **The warrants are traded separately after issue.**

As an illustration, Marlin issued free equity subscription. A warrant allowed the holder to subscribe to one Marlin share at NZ$1.28 on 20 May 2022. In June 2021 the Marlin warrants were trading at NZ$0.24, whereas Marlin shares were trading at NZ$1.45.

As liquidity in the stock and bond markets has increased, financial institutions have taken the opportunity to issue warrants on existing securities independently of the company that issued the underlying shares. These securities are also called **covered warrants** because the issuing institution covers itself by buying the underlying securities on the market.

Warrants ordinarily involve a transaction between one investor and another and therefore play no direct role in financing a business. There being no limits to the imagination, some players have not hesitated in creating warrants on baskets of existing securities (such as indices). Thus, a warrant on a basket of different shares gives one the right to acquire, during a given period of time, a lot consisting of those shares, in proportions and at an overall price fixed in advance.

2/ VALUE

Conceptually, a warrant is similar to a call option sold by a company on shares in issue or to be issued. The exercise price of this option is the price at which the holder of the warrant can acquire the underlying security; the expiry date of the option is the same as the expiry date of the warrant.

A warrant, however, has a few particular characteristics that must be taken into account in its valuation:

It normally has a long life (typically two to three years but sometimes much more, six years for Prologue), which increases its time value and makes it more difficult to accept the assumption of constancy in interest rates and volatility used in the Black–Scholes model.

The underlying asset is more likely to pay a periodic return during the time the warrant is held:

> For an equity warrant, the payment of dividends on the underlying share lowers the value of that share and thereby reduces the value of the warrant. More generally, any transaction that changes the value of the share affects the value of the warrant.
>
> For a debt warrant, the price of the underlying bond varies over time and, as we saw in Chapter 20, the closer a bond comes to maturity, the more its market price tends towards its redemption price. Its volatility gradually declines, making the Black–Scholes model, which assumes constant volatility, inapplicable as stated.

Lastly, in the case of subscription warrants, the dilution associated with exercise of the warrants entails a gradual change in the value of the underlying security. When investors exercise warrants, the number of outstanding shares increases and the issuing firm receives the strike price as a cash inflow. When investors exercise call options, no change in outstanding shares occurs as call options are options on shares that already exist and not on new shares to be issued; hence, the firm receives no cash.

To get round these difficulties, traders use models derived from the binomial and Black–Scholes models, taking into account the fact that the exercise of warrants can create more shares and thus affect the stock price.

3/ THEORETICAL ANALYSIS

Agency theory offers an almost “psychological” approach to these securities. They are seen as a preferred means of resolving conflicts between shareholders, lenders and managers.

Take a bond with attached equity warrant as an example. A hybrid security of this kind may seem unnatural since it combines a low-risk asset (bond) with a high-risk asset (share).

However, there is something in it for each of the parties.

The company's **managers** benefit from the flexibility that warrants provide, since the company can set bounds on the date of the capital increase (by setting the subscription period of the warrant) and the amount of funds that will be raised (by setting the exercise price and the number of warrants per bond at appropriate levels). The amount of funds raised in the form of bonds can be completely different from the amount potentially raised later in the form of shares. Furthermore, the company may be able to use the funds from both sources for several years, since the warrants may be exercised before the bonds are paid off.

A company that wants to accomplish the capital increase part of the issue quickly will set an exercise price barely above, or even below, the current price of the share. If it chooses, it can also move up the beginning of the subscription period. If it prefers to bring in a greater amount of funds, it will increase the number of warrants per bond (which must then have a lower yield to maturity if equilibrium is to be maintained) and potentially raise the exercise price of the warrants.

Because it entails selling an option, though, the opportunity cost of a warrant can be substantial. Take the case of a company that has sold for €10 the right to buy one share at €100. Suppose that at the time this warrant becomes exercisable the shares are trading at €210. A straight capital increase without a rights issue at a very slight discount to the share price would bring in, say, €205 per share, whereas exercise of the warrants will bring in €110 per share all told. The opportunity cost is €95 per share.

Stock market history has shown that exercise of warrants can never be taken for granted. After the steep decline in stock markets in 2007/2009, firms that issued warrants before this period have a very low probability of being able to raise equity thanks to these warrants.

The holders of bonds with attached equity warrants, if they keep both securities, are both creditors and potential shareholders. As creditors, they benefit from a small but relatively certain yield; as potential shareholders, they have hopes of realising a capital gain.

In a context of rising interest rates and falling share prices, however, holders of bonds cum warrants suffer the downside risks of both debt and equity securities, instead of combining their advantages.

On the other hand, the holders of the bonds may be different from the holders of the warrants. The bonds may end up with investors preferring a fixed-rate security, while the warrants go to investors seeking a more volatile security.

In appearance only, **existing shareholders** retain their proportionate equity stake in the company. The warrant mechanism makes for gradual dilution over time. An issue of bonds with equity warrants allows existing shareholders to maintain their control over the company with a smaller outlay of funds, since they can buy the warrants and resell the bonds. If they do this, the securities they end up holding will be much riskier overall because the bonds will no longer be there to cushion fluctuations in the value of the warrants.

The dilution problem is postponed. When the warrants are exercised, they may have risen in value to such an extent that existing shareholders can pay for virtually all of their proportionate share of the capital increase by selling their warrants in order to finance their share subscription.

4/ PRACTICAL USES

Warrants are increasingly widely used in corporate finance:

By a company in difficulty that wants to raise fresh capital. Before going ahead with a capital increase, the company decides to make a bonus distribution of warrants to existing shareholders. In practice, the shareholders are giving themselves these warrants. They can then speculate more readily on the company's turnaround. This was the case for CGG in 2018.

When creditors are cancelling debts due to them, shareholders may give them equity warrants in return. The value of these warrants is virtually nil at the start, but if the company regains its footing, the warrants will rise in value and make up for some or all of the loss on the cancelled debts. A deal of this kind is the way to reconcile the normally divergent interests of creditors and shareholders. In modern finance, this technique replaces the "return to better fortune" clause in loan agreements.

In a tender offer for shares of company A in exchange for shares of company B, shareholders of A may be offered not only shares of B but also warrants for shares of B.

In a leveraged buyout (LBO, see Chapter 47), warrants may be used to offer an additional reward to holders of mezzanine debt or even to management (another instance of an "equity kicker").

As a management-incentivisation tool, warrants can be used as an alternative to stock options or performance shares. The key difference lies in the fact that warrants have to be acquired by management (whereas stock options or performance shares are distributed free of charge).

5/ REDEEMABLE WARRANTS

Redeemable warrants are warrants that can be redeemed by the issuer. The company can redeem, at nominal price, the warrants in case the share price exceeds a certain threshold. In practice this means that the company can force the exercise of the warrants after a certain time if conversion conditions are met, as the redeemable warrant holder will prefer exercising rather than being redeemed at nominal price.

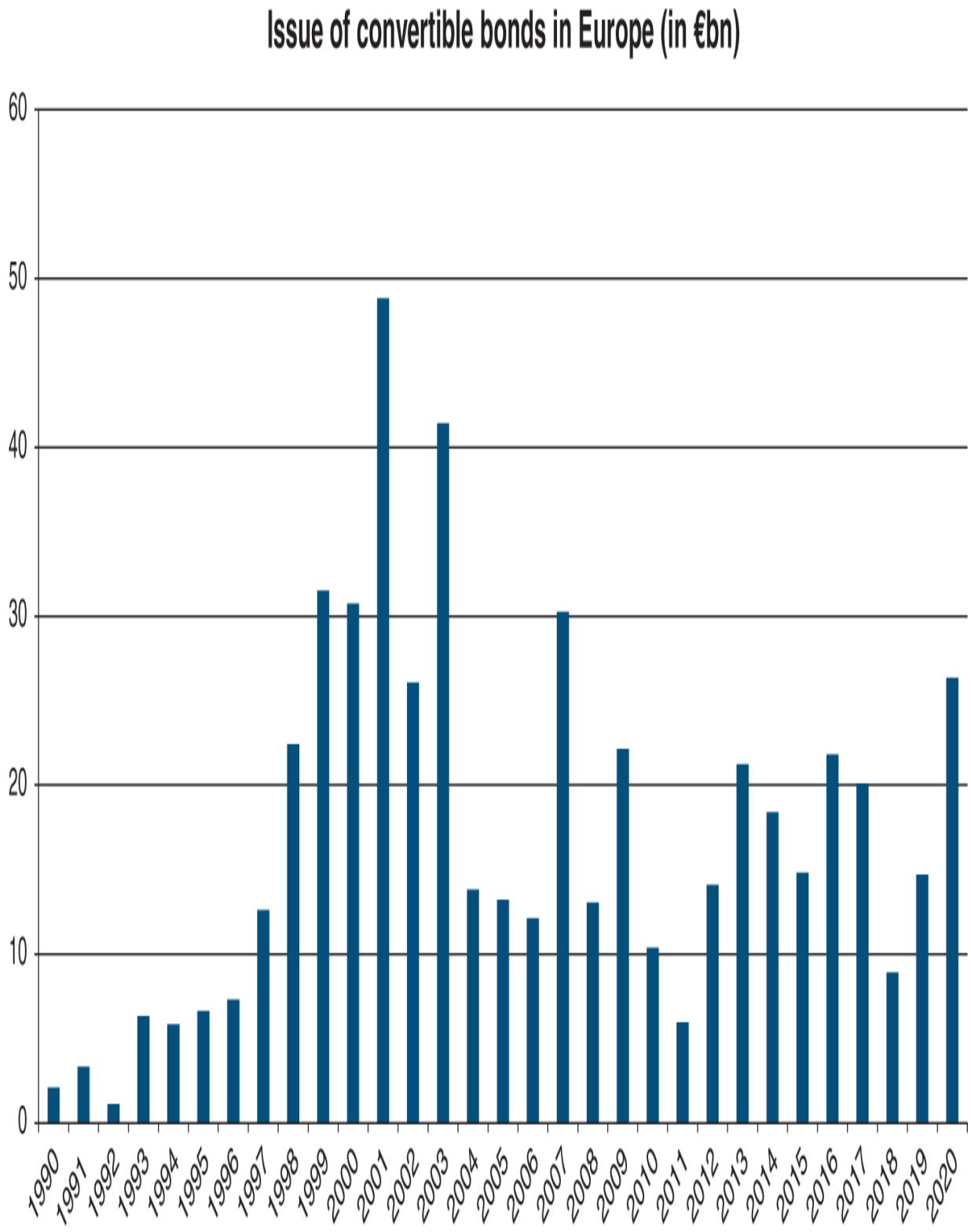
This is equivalent to a "soft call" clause in a convertible bond contract (see below).

This product is usually tied to a bond and issued by mid-sized companies to refinance bank loans. Some groups issued bonds cum redeemable warrants subscribed by banks that kept the bonds and sold the warrants to the management, thus partially replicating the management packages of LBOs.

Section 24.2 CONVERTIBLE BONDS

1/ DEFINITION

A **convertible bond** is like a traditional bond except that it also gives the holder the right to exchange it for one or more shares of the issuing company during a conversion period set in advance.


Issue of convertible bonds in Europe (in €bn)
60
50
40
30
20
10
0
1990
1991
1992
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1999
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2018
2019
2020

The flexibility of convertible bonds explains their great success, particularly when financial markets are depressed such as 2003, 2009 and 2020 which have been record years for the issuance of convertible bonds.

Source: Data from Dealogic

As an example, in April 2021 the medtech Predilife issued a convertible bond with the following characteristics:

PREDILIFE APRIL 2021 CONVERTIBLE BOND ISSUE (€4m)	
Issue price:	€5,000
Face value:	€5,000
Issue date:	30 April 2021
Maturity:	30 April 2024
Interest rate:	7% i.e. a €350 annual coupon capitalised
Redemption price:	€5,000
Conversion ratio:	612.5 shares for 1 bond
Conversion period:	From 30 July 2021 to 20 April 2024 subject to share price trading above €10
Predilife share price at the time of issue:	€7.25

The **conversion period** is specified in the bond indenture or issue contract. It may begin on the issue date or later. It may run to the maturity date, or a decision may be forced if the company calls the bonds before maturity, in which case investors must choose between converting them into shares or seeing them being redeemed in cash.

The bond may be convertible into one or more shares (612.5 shares for each bond in our example). This ratio, called the **conversion ratio**,[1] is set at the time of issue. The conversion ratio is adjusted for any equity issues or large buy-backs above market price, mergers, asset distributions or distributions of bonus shares in order to preserve the rights of holders of the convertibles as if they were shareholders at the time of issue.

The **conversion premium** is the amount by which the conversion price exceeds the current market price of the share. A conversion premium is typical. In our Predilife example, the conversion premium is 38%.[2] Since Predilife offered no redemption premium, its shares must rise 38% by the maturity date of the bonds for investors to be willing to convert their bonds into shares rather than redeem them for cash. The calculation is slightly different when a redemption premium is involved.

Some convertible bonds are issued with a **call provision** that allows the issuer to buy them back at a predetermined price. Holders must then choose between redeeming for cash or converting into shares. The indenture may provide for a minimum period of time during which the call provision may not be exercised ("hard non-call" period, usually at least one year) and/or set a condition for exercising the call provision, such that the share price exceeds the conversion price by more than a percentage, most of the time 30%, for more than 10 days ("soft call" provision). The Predilife convertible bond does not have a soft call provision.

In some cases, the issuer may, upon conversion at the holder's request, provide either newly issued shares or existing shares held in portfolio – for example, following a share buy-back, as is the case for the Predilife bond issuance. In other cases, the issuer has the right to provide the counter value in cash of the shares that were to be given for repayment. This makes it possible to limit the dilution of current shareholders.

As with other debt instruments, convertible bonds can be green if the proceeds are used for energy transition investments (Neoen, EDF), or sustainable (Schneider), if the return paid to investors is increased in case certain ESG objectives are not met (energy consumption, CO_2 emissions, increasing gender diversity, etc.).

Convertible bonds must not be confused with the similar-sounding **exchangeable bonds**, which are pure debt securities from the point of view of investors. We are going to study them in Section 24.4.

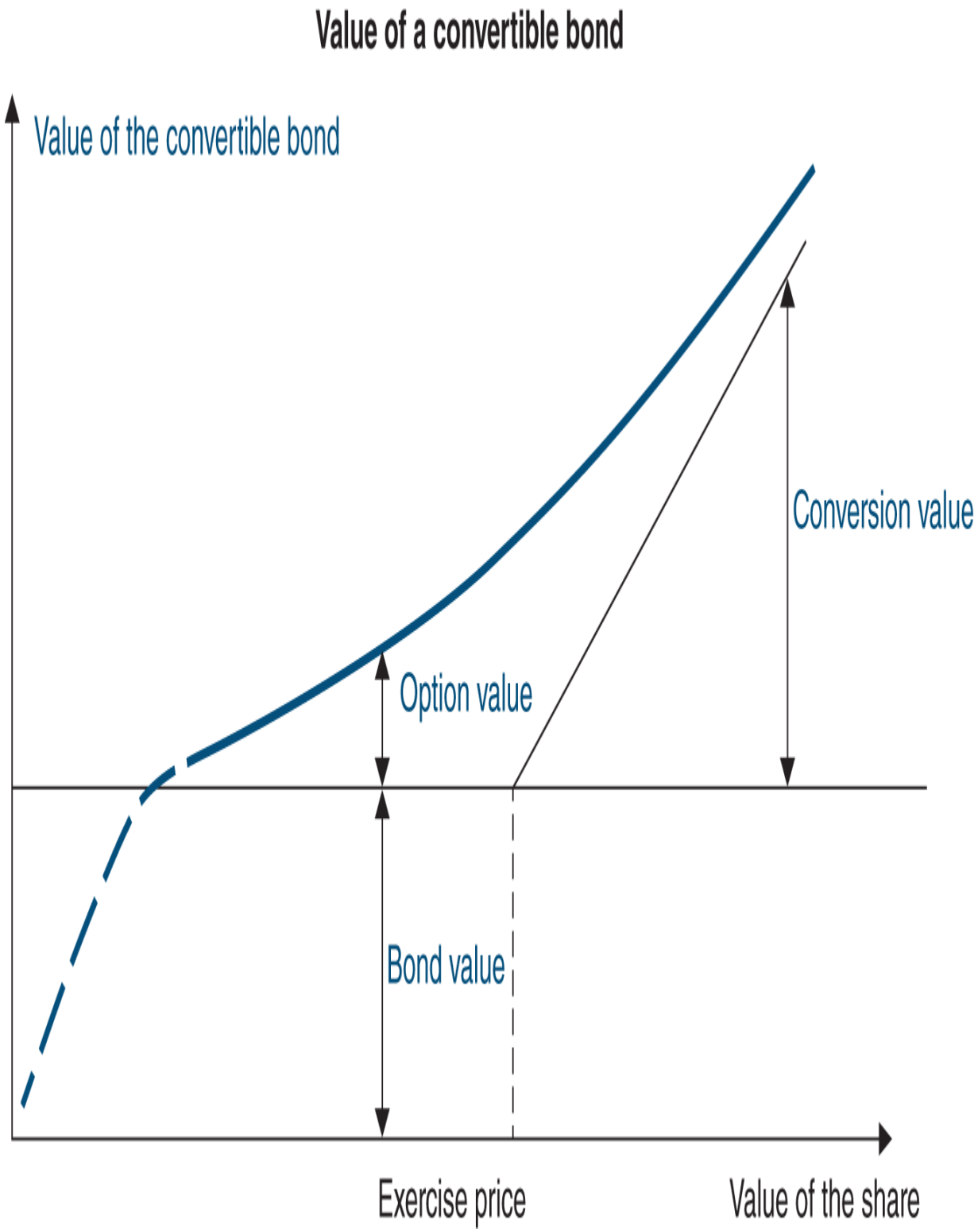
2/ VALUE

The value of a convertible bond during its life is the sum of two components:

Convertible bond = bond value + call option

The value of the straight bond alone is called the **bond value** of the convertible bond. It is calculated by discounting the future cash flows on the bond at the market interest rate, assuming no conversion. The bond value thus represents a minimum value: the convertible will never be worth less than this floor value, even if the share price falls significantly. It also cushions the impact of a falling share price on the price of the convertible. Bear in mind, though, that investment value is not a fixed number but one that varies as a function of changes in interest rates.

The **option value**. To the bond value is added the value of the conversion option. The higher the share value exceeds the redemption price of the convertible bond, the higher the value of the conversion option, and the lower the share value falls below the redemption price of the convertible bond, the lower the value of the conversion option.



Whenever the share price is well above the redemption value of the convertible bond – as in the “share” zone of the following chart for Rémy Cointreau in summer 2020 – the convertible bond behaves more and more

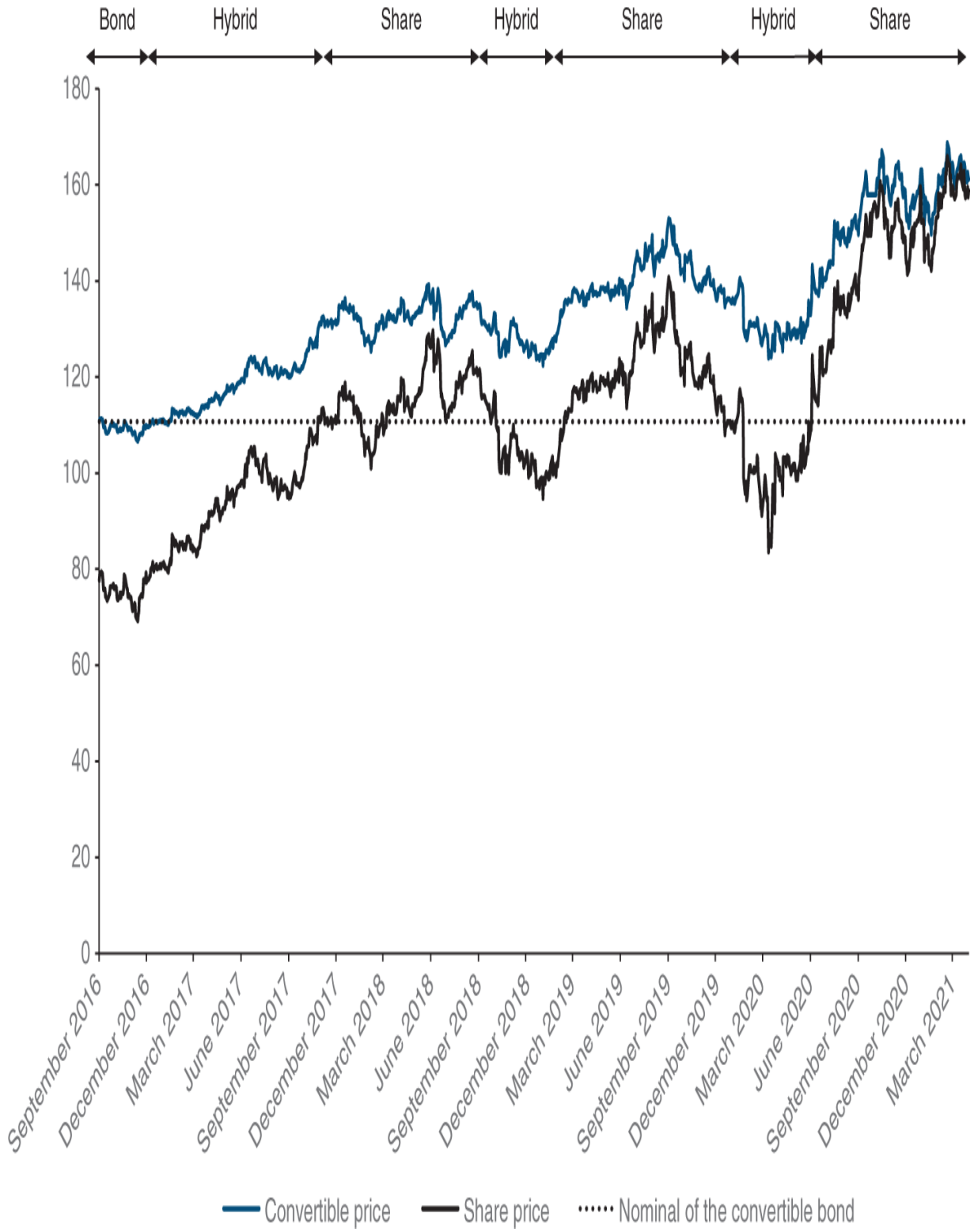
like the share because the probability that it will be converted into shares is very high.

In the “bond” zone, the convertible bond behaves essentially like a bond because, given the level and trend of the share price, the probability of conversion is low. The price of the convertible bond is close to its investment value. This was the case for the Rémy Cointreau convertible bond in the months following its issue in the autumn of 2016.

In the “hybrid” zone, the value of the convertible reflects the simultaneous influence of both the level of interest rates and the price of the underlying security, as for the Rémy Cointreau convertible bond in spring 2020.

There can also be a high-risk zone for the convertible bond if the share price has fallen sharply. Heavy doubts appear as to the company's ability to repay its debts. The price of the convertible bond adjusts downwards accordingly, until it offers a yield to maturity consistent with the risk of default by the issuer.

Example of the 2026
Remy Cointreau convertible bond (€)



The convertible issued by Rémy Cointreau behaved like a bond when first issued in 2016, but from December 2017 until December 2019 it had become virtually indistinguishable from the share. During the first half of 2020, it behaved like a bond and since summer 2020, it has reverted to a share-like behaviour.

Source: Data from Bloomberg

At issue, the bond value most often represents 85–95% of the value of the convertible bond and the call option 5–15%. The lower the conversion premium, the closer the convertible bond will be to a share since conversion into shares will be very likely. The coupon of the convertible bond may therefore be low. Conversely, the higher the conversion premium, the closer the convertible bond will be to a bond requiring a higher yield. By balancing these characteristics of the convertible bond, the CFO will be able to tailor the convertible bond to the cash flow profile of the company and the dilution appetite of its shareholders.

3/ SYNTHETIC BONDS

In the mid-2010s, peculiar convertible bond issues were implemented with the following principle: the firm issues convertible bonds to investors and acquires call options at the same time (from one or several banks) that mirror the options imbedded in the convertible bonds. The convertible bonds and options have the specificity of offering only a cash settlement (the counter value in cash of the shares being paid in case the option is exercised). For the firm, the bundling of the issuance of a convertible bond and the acquisition of a call replicates the cash flows of a plain vanilla bond exactly. For the company, it is the same as issuing a plain vanilla bond.

This product can be attractive when market appetite for convertible bonds is high. There may then be a true arbitrage opportunity that allows the firm to sell the call option to investors at a higher price than the price it paid the banks. In this case, the yield of the instrument, called an Equity Neutral Convertible Bond (ENCB), will come out as lower than that of a traditional bond. This combination can also be used for firms that do not have access to the bond market.

Companies that have issued synthetic bonds include LVMH, National Grid, Total, Iberdrola, Michelin, and HDFC, amongst others.

4/ THEORETICAL ANALYSIS

Unlike a bond with attached equity warrants, a convertible bond is an indivisible product. The straight bond cannot be sold separately from the call option.

For the investor, the convertible bond is often presented as a miracle product, with downside protection by virtue of its debt component and upside potential by virtue of its equity component.

In much the same fashion, the convertible bond is pitched to issuers as the panacea of corporate finance. Initially, it enables the company to issue debt at an interest rate lower than the normal market rate; at a later point, it may enable the company to issue fresh equity at a price higher than the current share price.

No! There are no miracles in finance. At best, one can find mirages, and this is one. If the company is able to issue bonds at an interest rate below its normal cost of debt, it is because it has agreed to issue shares in the future at a price *below* the share value at that time – necessarily below, or conversion would not take place. *Current shareholders will therefore be diluted on poor terms for them*. In addition, the argument of a lower rate is true only in terms of cash, as under IFRS the current interest rate at which the company could issue an ordinary bond must be applied when recording associated interest expenses in the P&L, even if it actually pays a lower interest rate on its convertible bonds.

Similarly, if investors are getting a call option on the share, it is because in return they accept a lower rate of return on the bond than the issuer-specific risk would justify.

The apparent cost of the convertible bond is low only because its true cost is partly hidden. The company is selling investors call options, which they pay for by accepting a lower interest rate on the bonds than the company could normally obtain given its risk.

The cost of a convertible bond may be calculated in intuitive fashion as a weighted average of the cost of equity and the cost of debt. The weighting corresponds to the probability that the convertible will actually be converted. This probability is not hard to estimate if one assumes that

returns on the share are normally distributed (then the expected yearly increase in share price is equal to the cost of equity less the dividend yield).

Equilibrium market theory is not of much help in explaining why convertible bonds, which are no more than a combination of two existing products, should themselves exist. Agency theory and signalling theory – together with the “matching hypothesis” – are far more useful in understanding the usefulness of convertibles.

According to **agency theory**, a convertible bond is a mode of **resolving conflicts between shareholders and creditors**. Managers of leveraged companies can be tempted to undertake risky investments that increase shareholder wealth at the creditors' expense. With this fear in mind, creditors refuse to finance the company except via convertible bonds. Creditors will then have some protection, since the convertible gives them the option of becoming shareholders if there are transfers of value working against them as creditors. A heavily indebted company may have to pass up highly profitable investment projects if it cannot obtain bank financing that would not put too great a strain on its cash flow at the start. With its low apparent interest cost, the convertible bond is an attractive alternative. A convertible bond also helps in **resolving conflicts between shareholder-managers and outside shareholders**. Shareholder-managers of a company with convertible bonds outstanding will hesitate to divert company resources to private use at the expense of other shareholders, since they know that would increase the probability of having to redeem the convertibles in cash. If the company is already carrying a sufficiently high debt load, redemption could put it in difficulty and threaten the managers' position, so they are deterred from taking such action.

The matching hypothesis provides another contribution to the explanation of why convertible bonds exist. A young, fast-growing company or one with limited financial resources will avoid taking on too much debt, as its cash flow is likely to be highly variable and its cost of debt, given its short history, likewise high. In these cases, it makes sense to issue securities whose cash flows **match** those of the firm.

A fast-growing company will have little inclination to issue more shares, either because it believes its shares are undervalued or because it **fears sending out a negative signal** (see Chapter 38). That leaves only convertible bonds. Investors, relieved that the signal associated with a capital increase has not been sent, will welcome an issue of convertibles (e.g. Voltalia). This is what the **signalling theory** assumes.

Taken together, these three explanations provide good reasons for issues of convertible bonds by smaller companies that are growing rapidly, are already heavily indebted or have assets that are quite risky. We could also add another explanation, which is commonly known as the **"backdoor equity" hypothesis**. Young, growing firms cannot usually issue debt because of the high financial distress costs. At the same time, they may be unwilling to issue equity if current stock prices are too low. Thus, convertible bonds could offer a good compromise solution. Convertible bonds cause expensive dilution, but it occurs when the firm can afford it!

The market for convertibles is also supplied by large groups (e.g. Safran, Schneider), which use it to raise funds from specialised investors that invest only in convertible bonds. For these large groups, convertibles offer **a way of diversifying the investor base** and raising money in large quantities more easily. Lastly, groups in financial difficulty will resort to issuing convertibles when the equity market is closed to them (Just Eat).

Section 24.3 PREFERENCE SHARES

The securities called **preference shares** (a term prevailing in the UK) or **preferred shares** (a term prevailing in the US) enjoy economic advantages over ordinary shares, typically in return for a total or partial absence of voting rights.

1/ DEFINITION

Preference shares are created on the occasion of a capital increase by the decision of the shareholders at an (extraordinary where applicable) general meeting.

The advantages conferred on preference shares may include:

a claim to a higher proportion of earnings than is paid out on other shares;

priority in dividend distributions, meaning the dividend on preference shares must be paid before any ordinary dividend is paid on other shares;

a cumulative dividend, so that if earnings are insufficient to pay the preference dividend in full, then the amount not distributed becomes payable from future earnings;

a firm cannot go into default if it misses paying some dividends;

rating agencies and financial analysts consider preference shares a part of equity (thus improving the rating of the company).

At the same time, there are two important disadvantages in issuing preference shares.

for the issuer – because it adds a layer of complexity; and

for the investors – because they may have limited voting rights, although in private companies they may have multiple voting rights.

We should note here that the term “preferred securities” (often shortened to just “preferreds”) is much broader in scope and may encompass convertible bonds and subordinated debt securities as well as preference shares without voting rights. The reader is advised to look closely at the detailed characteristics of any security called a “preferred” and not to assume that it is necessarily a preference share.

Special features can be added to preference shares to make them more attractive to investors or less risky to issuers:

adjustable-rate preference share: the dividend rate is pegged to an index rate, such as a Treasury bill or Treasury bond;

participating preference share: the dividend is divided into a fixed and a variable component. The latter is generally set as a function of earnings;

trust preference share: the dividend on these stocks is tax-deductible like interest expenses. Firms issuing this security get the tax shield of debt and keep leverage low (because preference shares are treated like equity by analysts and rating agencies).

2/ VALUE

It is complex to generalise the valuation formula of preference shares as the term covers products that can have very different features. Preference shares will normally be valued just like ordinary shares (taking into account the potential higher dividend stream). The value of the preference share will be equal to the value of the ordinary share to which you need to:

add the value of the advantages granted;

deduct a liquidity discount for public companies (as the preference share will generally have low liquidity). This discount is almost always observed in trading prices;

potentially deduct the value of the voting right.

As each of these elements is difficult to assess, the value of the preference share will be quite uncertain.

3/ THEORETICAL ANALYSIS

(a) For the company

Preference shares can enable a company, which is in difficulty but has a good chance of recovering, to attract investors by granting them special advantages.

Banks are often issuers of preference shares because these securities are classified by central banks as part of the bank's own funds for the purpose

of determining its net capital. This is so even though the preference share pays a constant annual dividend expressed as a percentage of par value, which gives it a strong resemblance to a debt security. Analysts are not fooled; for their purpose, preference shares are reclassified as debt.

Against these advantages, preference shares also present several drawbacks:

They cost more than a traditional capital increase: the preference dividend is higher than the ordinary dividend, whereas the preference share itself is usually worth less than the ordinary share because of its lesser liquidity.

Their issuance entails complications that are avoided with an ordinary capital increase, such as calling a special shareholders' meeting.

Furthermore, understanding such issues can be quite difficult. Preference shares frequently trade at a steep discount to theoretical value because holders demand a big premium over market value before they will sell or exchange them.

(b) For current shareholders

For a majority shareholder, issuing preference shares makes sense only if those shares have no voting rights. When this is true, a capital increase can be accomplished without diluting their control of the company. A company with family shareholders may issue preference shares in order to attract outside financial investors without putting the family's power over the company in jeopardy. For the minority shareholder, this seems to us to be a second-best solution: the only way to strengthen shareholders' equity when the majority shareholder does not want to follow a capital increase or be diluted. It is just as if the company's cost of capital had been raised.

The flexibility offered by preference shares is undoubtedly of interest to unlisted companies. Indeed, they make it possible to organise corporate governance between the shareholders involved in management and the financial shareholders. We can therefore see them flourish in private equity (to finance start-up, development, transmission or the acquisition of a company), and in particular LBOs. Today, issuances of new preference shares have virtually disappeared from stock markets, which prefers a single line of listing per company with a large volume of transactions and

equality of shareholders. Intesa Sanpaolo thus imposed the merger of its two types of shares in 2018.

Section 24.4 OTHER HYBRID SECURITIES

1/ HYBRID BONDS

Also called deeply subordinated bonds, or simply hybrids, they present the following features:

Very long maturity (more than 50 years) or no duration (i.e. perpetual). Some hybrids include a hard non-call provision prohibiting the firm from redeeming the issue before a certain date. Generally the interest rate increases in time (step-up), which encourages the firm to redeem the bonds as the price becomes prohibitive (but there is no legal requirement to do so).

Ranking: in case of liquidation, the securities must rank senior only to share capital.

Conditional payment of interest: under certain conditions, such as non-payment of dividends to shareholders, payment of the coupon/dividend to investors must be left at the issuer's entire discretion. In certain cases, the non-payment must be compulsory if some debt ratios are not satisfied.

No voting rights is attached.

The issuer may commit to redeeming the issue only by issuing equity or a similar hybrid instrument.

Depending on the exact features, some issues may be classified as equity under IFRS as there is no commitment to redeem and as payment of interest may be suspended. Nevertheless, IASB is considering changing its stance on this subject.

Conceptually, these are nothing other than very long-term debt securities, whose extremely subordinated nature could lead to them being assimilated, from an accounting point of view, to equity, which in our view is wrong.

Rating agencies adopt a hybrid treatment by restating these issues in one part debt and one part equity (the equity content). So, for example, Moody's carries out a precise analysis of the terms and conditions of the issue (in accordance with a pre-established table) and classifies the issue in a basket (B, C or D) to which is attached an equity content (25%, 50% or 75%) for investment grade firms. Issues made by non-investment grade issuers are considered as 100% debt by Moody's.

Industrial groups use hybrid bonds either to diversify their investor base (Orange, Engie which issued a green hybrid) or to secure their rating and strengthen their capital structure (Arkema, Unibail-Rodamco-Westfield, Abertis).

2/ MANDATORY CONVERTIBLES

Unlike convertible bonds, for which there is always some risk of non-conversion, **mandatory convertibles** are **necessarily** transformed into equity capital (unless the issuing company goes bankrupt in the meantime) since the issuer redeems them by delivering shares; no cash changes hands at redemption.

The value of a bond redeemable in shares is the present value of the interest payments on it plus the present value of the shares received upon redemption. In pure theory, this is equal to the value of the share increased by the present value of the interest and decreased by the present value of the dividends that will be paid before redemption. The discount rate for the interest is the required rate of return on a risky debt security, while the discount rate for the dividends is the company's cost of equity.

Under IFRS, their issue value is broken down between the present value of interest shown as debt and the balance in shareholders' equity.

Mandatory convertibles are not a very attractive product on the financial markets (there is no suspense, unlike the convertible bond!), so it is not very common there. Rather, it is used in very specific arrangements for unlisted companies, often with tax or legal concerns. In 2020, ArcelorMittal issued a mandatory convertible for which the conversion parity was linked to the share price. This issue has allowed to differ the dilution of the Mittal family in the capital.

For tax purposes, bonds redeemable in shares are treated as bonds until they are redeemed, and subsequently as shares.

They have been issued by a number of companies, large and small, to raise capital, including Texas Instruments, General Motors, Citicorp, Lafarge, AXA and Sears.

3/ EXCHANGEABLE BONDS

An **exchangeable bond** is a bond issued by one company that is redeemable in the shares of a second company in which the first company holds an equity interest. Thus, while a convertible bond can be exchanged for specified amounts of common stock in the issuing firm, an exchangeable bond is an issue that can be exchanged for the common stock of a company other than the issuer of the bond.

At maturity, two cases are possible. If the price of the underlying shares has risen sufficiently, then holders will exchange their bonds for the shares; the liability associated with the bonds will disappear from the issuer's balance sheet, as well as the underlying shares. If the price has not risen enough, then holders will redeem their bonds for cash and the issuer will still have the underlying shares. In neither case will there be any contribution of equity capital. An exchangeable bond is therefore like a collateralised loan with a call option for the holder on securities held in the company's portfolio.

For the investor, a bond issued by company *X* that is exchangeable for shares of company *Y* is very close to a convertible bond issued by *Y*. The only thing separating these two financial instruments is the default risk of *X* versus that of *Y*.

By way of example, in February 2021 Bigben issued a bond exchangeable for shares in Nacon (for a total of 10.67% of Nacon). Bonds are exchangeable with shares with a premium of 16% for five years. This issue raised €87m for the group at an apparent interest rate of 1.70%. The quid pro quo is obviously twofold: for one thing, Bigben cannot be sure of having unloaded a part of its holding in Nacon; for another, if it does succeed in disposing of that stake, it will have let it go at a price below its market value. But on the face of it, Bigben has obtained long-term financing with a low interest rate.

For the investor, a bond issued by Bigben that is exchangeable for Nacon shares and a convertible bond issued by Nacon are very similar financial instruments; only the risk of default differentiates them (Bigben or Nacon).

SUMMARY

The summary of this chapter can be downloaded from www.vernimmen.com.

Hybrid securities often seem to be equity, but that is not always the case. A convertible bond that is not converted remains a debt; a bond with attached warrants is, likewise, still a debt.

Many of these hybrids give the impression of lowering the company's cost of financing. Do not believe it! In markets in equilibrium, all sources of financing have the same cost when adjusted for the risk taken by the investor. It is not enough to look only at the apparent cost; the full cost of any source of financing must be understood and taken into account. Similarly, these securities give the impression of belonging to the world of high finance. More often than not, though, their use is a sign that the issuer is in trouble or is having difficulty placing ordinary equity or debt securities with investors.

Agency theory explains the existence of these products by showing their usefulness in resolving potential conflicts between shareholders and creditors or between shareholder-managers and outside shareholders. Signalling theory sees in them the mark of an undervalued, heavily indebted company that is unwilling to finance itself through a traditional capital increase.

A convertible bond is like a traditional bond, generally one bearing a fixed rate, except that it also gives the holder the right to exchange it for one or more shares (depending on the conversion ratio) of the issuing company during a conversion period set in advance. Its value is analysed as the sum of the value of the traditional bond and the value of a call option on the shares with an exercise price equal to the conversion price.

Convertible bonds are issued at lower coupon rates than traditional bonds. This is not an advantage for the issuing company but merely the compensation for the call option it has granted the investor “at no charge”.

A subscription warrant is a security that allows the holder to subscribe during a given period, in a proportion and at a price fixed in advance, to another security. A subscription warrant may be attached to an issue of

shares or bonds or distributed by itself “at no charge”. Conceptually, a warrant is a form of call option sold by the company on shares to be issued. Issuing warrants enables a company to accomplish a capital increase by a process of gradual dilution.

Preference shares, mandatory convertibles, deeply subordinated debt and exchangeable bonds are other categories of hybrid securities.

QUESTIONS

1/Can any financial product normally make it possible to obtain resources at below market cost?

2/Define: convertible bond, bond with equity warrants, preference share, investment certificate and bond redeemable in shares.

3/The bond market yield is 7%. A company issues a bond with equity warrants at a gross yield to maturity of 3% assuming the warrants are not exercised. What is the cost of this product? What is the breakdown of that cost?

4/Is a convertible bond more costly to the issuing company than a bond with equity warrants?

5/Which is (are) the most appropriate financial product(s) for the following companies:

a company that wants to raise fresh equity capital immediately but does not want to risk losing control;

a company with a very volatile share price that wants to gradually broaden its shareholder base;

a company emerging from a period of difficulties whose future is still perceived by investors to be risky.

6/Rank convertible bonds, bonds with equity warrants, preference shares and new ordinary shares in terms of:

actual or potential dilution;

achieved rate of return;

potential capital gain;

cost to the issuing company.

7/Which product would *appear* to be a case of “tails I win, heads you lose”?

8/Show that if managers think their company's shares are undervalued, there is a better product to issue than a convertible bond.

9/Show that if managers think their company's shares are overvalued, there is a better product to issue than a convertible bond.

10/Given your answers to Questions 8 and 9, how do you explain the existence of convertible bonds?

11/True or false:

The higher the conversion premium, the higher the coupon rate on a convertible bond.

The higher the volatility of the underlying share, the higher the conversion premium.

A rise in the payout ratio on the underlying share increases the probability of conversion before a convertible bond matures.

A convertible bond does not offer the same percentage of upside participation in the share price as the share itself, but in return it offers downside protection.

12/Why isn't a bond redeemable in shares attractive to financial investors?

13/Why is there a good chance that preference shares will be worth less than the same issuer's ordinary shares, despite the preferences accorded to them?

You'll find more questions at www.vernimmen.com.

EXERCISE

1/Company X has capital of 2 million shares that are currently trading at €2,000 per share. On its balance sheet it has a liability for an issue of convertible bonds with the following characteristics:

nominal value: €500m (500,000 convertible bonds of face value €1,000 each);

interest rate: 5%;

conversion ratio: 1 for 1.

Company X expects to have a net profit of €300m next year.

Calculate X's *fully diluted* earnings per share. The corporate income tax rate is 36.7%.

Redo the same exercise, replacing the convertible bond with a bond with attached warrants to subscribe to one share of X at €2,100. Assume the pre-tax rate of return on short-term investments is 8%. Use two different methods to make your calculations.

What would be the result of the calculation in (b) above if X issued the bond with warrants to pay off another borrowing at a pre-tax interest rate of 8%? Assume that the expected net profit is after interest expense on the previous borrowing.

ANSWERS

Questions

1/*Normally, no.*

2/*See definitions in this chapter.*

3/*An average between 7% and the cost of equity weighted by the probability of the warrants being exercised.*

4/*There is no basis for affirming that either one is more costly than the other.*

5/*Preference shares (but no one is fooled); convertible bonds; convertible bonds.*

6/*In descending order of dilution: preference shares, ordinary shares, convertible bonds, bonds with equity warrants. In descending order of return: convertible bonds, bonds with equity warrants, preference shares, ordinary shares. In descending order of potential capital gain: ordinary shares, preference shares, bonds with equity warrants, convertible bonds. In descending order from the highest to the lowest cost: preferred shares, ordinary shares, convertible bonds and bonds with equity warrants.*

7/*Convertible bond.*

8/*Traditional bond that will be paid off by a capital increase once the share price has risen.*

9/*Ordinary shares that will never have to be redeemed.*

10/*By agency theory and signalling theory.*

11/*True: (b) and (d); false: (a) and (c).*

12/*Because it is simply a forward purchase of shares, payable immediately.*

13/*Because of their lower liquidity; there are many fewer of them than there are of the ordinary shares.*

Exercise

A detailed Excel version of the solutions is available at www.vernimmen.com.

1/

Saving on interest costs (after tax at 36.7%): €15.83m. Fully diluted EPS = €126.3.

Invest proceeds in short term: fully diluted EPS = €141.3. Use proceeds to buy back shares: fully diluted EPS = €151.9.

Gain on interest expense: (8% − 5%) × 0.6333 × 500 = €9.50m; by the short-term investment method: fully diluted EPS = €145.1; by the share buy-back method: fully diluted EPS = €156.7.

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NOTES

1 *Bond traders also speak of the conversion price of a convertible bond, which is calculated as the ratio of the face value of the bond to the conversion ratio.*

2 *Compared to Predilife share price* $(5{,}000 \times 1.07^3) / 612.5 / 7.25 - 1 = 38\%$.

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Chapter 25
SELLING SECURITIES

Get 'em while they're hot!

Now that we have studied the properties of the various financial securities, let's see how companies sell them to investors. Bank finance was beautiful in its simplicity – whenever a company needed funds, it turned to its bank. Now that direct financing has become more common, companies can raise funds from a great many investors whom they do not necessarily know. That means they have to market their financing!

Section 25.1 GENERAL PRINCIPLES IN THE SALE OF SECURITIES

1/ THE PURPOSE OF OFFERINGS

> The company's main goal in selling its securities to investors is to obtain the highest possible price.
>
> For the sale to be successful, the company must offer investors a return or a potential capital gain. Otherwise, it will be harder to gain access to the market in the future.

The offering must be in line with this objective. The price of a security is equal to its present value, as long as all publicly available information has been priced in. This is the very basis of market efficiency. Conversely, asymmetric information is the main factor that can keep a company from selling an asset at its fair value.

Investors must therefore be given the information they need to make an investment decision. The company issuing securities and the bank(s) handling the offerings must provide investors with information. Depending on the type of offering, this can be in the form of:

a mandatory legal written document called a prospectus, required by the exchange regulator (containing descriptive information: a reference document about the company, as well as a document detailing the transaction in question);

presentations by management via meetings/conference calls with investors or electronic roadshows;

valuations and comments by financial professionals on the deal and the issuer via notes by financial analysts and presentations to the bank's sales teams, for example.

A firm underwriting commitment by the bank(s) handling the transaction can provide additional reassurance to investors, because if the bank is willing to arrange and underwrite the offering, it must believe that the

offering will succeed and that the price is “fair”. After all, investors are also clients to whom the bank regularly offers shares.

> In any offering the bank's exact positioning is always ambiguous. In theory it is mandated by the company that is issuing the securities and must therefore defend that company's interests to the fullest. But to do so, it must persuade the investors, who are its regular customers, to subscribe. It cannot afford to lead its clients astray. In fact, it defends more or less strongly the interests of both, basically to safeguard its own!

Investor information needs and the complexity of the deal depend on the following:

The amount of information that is already available on the issuing company itself. Clearly, an initial public offering of shares in a company unknown to the market will require a big effort to educate investors on the company's strategy, business, financial profile and perhaps even the sector in which it operates. This information is already contained in the share price of a publicly traded company, as that price reflects investor anticipation. This is why it is generally easier to offer shares in a company that is already listed.

Investor risk. Investors need more information for shares than for bonds, which are less risky.

The type and number of investors targeted. In addition to regulatory restrictions, it is generally more difficult for a European company to sell its securities in the US than in Europe, especially if the company and its industry are not known outside its home country (sometimes the opposite can occur, as in the oil services sector, for example). Meanwhile, a private placement with a few investors is simpler than a public offering, market authorities imposing a lower level of information for transactions targeting only professional investors.

2/ THE ROLE OF BANKS

The bank(s) in charge of an offering have four roles, the complexity of which depends on the type of offering:

Arranging the deal, i.e. choosing the type of offering on the basis of the goal sought: volume of securities to offer and in what form and timetable, choosing the market for the offering, contacts with market authorities, preparation of legal documents in liaison with specialised attorneys.

Circulation of information: an offering is often an opportunity for an issuer to report on its recent activity, prospects and strategy. The consistency of this information is checked by the bank and the lawyers in charge of the deal during a phase called “due diligence”, which consists of interviews with the company's management. Information is also gathered by the brokerage arm of the bank and then put out in research notes written by the bank's financial analysts. The bank also organises meetings between the issuer and investors in one or more markets (roadshows or one-to-one meetings).

Distribution of the paper: the bank's sales teams approach their regular clients, the investors, to market the securities and take orders. The issue price is then set by the bank in liaison with the issuer or seller, and the securities are allocated to investors. An equilibrium price is established in the “after-market” phase. In the days after that, the bank may intervene in the market in order to facilitate exchanges of blocks among investors.

Underwriting: in some cases the bank provides the issuer (or seller) with a guarantee that the securities will find buyers at the agreed price. The bank thus assumes a certain market risk. The magnitude of this risk will depend on the type of guarantee and on the timing of the commitment.

Most offerings, especially public offerings,[1] require a **syndicate** made up of several banks. Depending on how involved it is in the deal, and in particular the degree of guarantee, any one bank may play the role of:

global coordinator, who coordinates all aspects of an offering; the global coordinator is also lead manager and usually serves as lead and book-runner as well. For fixed-income issues, the global coordinator is called the **arranger**;

the **lead manager** is responsible for preparing and executing the deal. The lead helps choose the syndicate. One (or more) leads also serve as book-runners. The lead also takes part in allocating the securities to investors;

joint-leads play an important role, but do not usually serve as book-runners;

co-leads may underwrite a portion of the securities but have no role in structuring the deal;

co-managers play a more limited role in the transaction, normally just underwriting a small portion of securities. Sometimes co-managers will provide no underwriting commitment and have no placement role, they will merely associate their names with the transaction. This being called “check collecting”.

For some transactions (a block trade of already existing shares or a bond issue), the banks may buy the securities from the seller (or issuer) and then sell them to investors. This is called a **bought deal**. Unsold securities go onto the bank's balance sheet.

A **firm underwriting** agreement carries less of a commitment than a bought deal. A firm underwriting is a commitment by the bank to buy the securities only if the offering fails to attract sufficient investor interest. In some cases, the bank may be released from its commitment in the event of *force majeure* like a market crash or a war declaration. A failure of the placement, not justified by a case of *force majeure*, is not a sufficient reason for the bank to withdraw.

Before agreeing to underwrite more complex deals, banks may wish to have some idea of investors' intentions. They do so via a process called **book-building**, which occurs at the same time that information is sent out and the securities are marketed. Volumes and potentially prices from potential investors are listed in the book. This helps determine if the transaction is feasible and, if so, at what price. Only after the book-building process do banks choose whether or not to underwrite the deal. Book-building allows the banks running the transaction to limit significantly their risk, by assuring them that investors are willing to buy the securities.

Book-building helps to determine, at a given moment, the best price for the seller and/or company and to allocate the securities on a more or less discretionary basis.

In simpler transactions such as the placement of blocks or the issue of convertible bonds, the bank will almost always get feedback from a limited number of investors on their interest in the transaction and on the pricing. Market soundings are regulated by a European Directive (market abuse regulation, MAR).

In some cases, the bank does not pledge that the transaction will go through successfully, only that it will make its best efforts to ensure that this happens. This is rare in a formal documented offer, as investor confidence could be sapped if there is no formal pledge that the deal will go through. As a result, best efforts is the rule only in offerings by smaller companies or in very special cases (companies in financial distress, for example).

In some transactions, the bank's commitment is halfway between an initial bought deal and a post-book-building bought deal. When a block of existing shares is being sold, a bank may make a “back-stop” or floor underwriting commitment, i.e. go through the book-building process but guarantee the seller a minimum price.

There are three techniques for adjusting the offering to investor actual behaviour during (or just after) the transaction: **extension clause**, **greenshoe** and **clawback**.

The extension clause allows shareholders wanting to sell shares or the company issuing new shares to sell more shares than initially planned if demand turns out to be strong. The option is disclosed in the prospectus and can be exercised at the time of the allocation. The size of the transaction can be increased by 15% in the case of a share issue and 25% in the case of a secondary placement.

To stabilise the price after the transaction, the issuer or seller may give the bank the option of buying a number of shares over and above the shares offered to investors (as many as 15% more in a capital increase and 25% more for block trades of existing shares). This is called a greenshoe (named after the first company to use it). The bank allocates all the securities to investors, including the greenshoe shares, i.e. more than the official offering. These additional shares are borrowed by the bank:

If the price falls after the offering, the bank buys shares on the market up to the limit of the greenshoe. This supports the price. It then has 30 days to resell these shares if the price moves back up. If the price doesn't rise, the bank repays the loan using the shares it bought to support the price. In this case the greenshoe is not exercised.

If the price moves up, the bank can resell the shares or, if the price rises immediately after the transaction, the bank no longer has the shares so it will pay back the loan by exercising the greenshoe. The company will thus have sold more shares than originally planned.

Greenshoes are used for secondary offerings (i.e. sale of existing shares), new share issues (the lead bank receives, free of charge, warrants that it may or may not exercise) or convertible bond issues (when it takes the form of a simple extension of the issue, decided two or three days after its launch).

An offering targeted at several categories of investors (institutional, retail, employees, etc.) will be split into several tranches reserved for each of them. The **clawback** clause gives the company some flexibility in the size of each tranche. Hence, if institutional demand is very heavy and retail demand very light, the clawback allows the shares initially allocated to retail investors to be reallocated to institutional investors.

If a large shareholder sells part of his shares through the transaction, the placement will be eased if this shareholder commits not to sell additional shares over a certain period of time (unless the bank coordinating the transaction gives the green light). This is called a **lock up** and lasts between a few months and a year.

To simplify the transaction, the bank may advise the company to target a limited number of investors, thus avoiding the rules governing a public offering, including supervision by market authorities, obligation to present information, etc. This is called a **private placement** and is possible on all types of products. Private placements are in particular often used in offerings to US investors (generally under rule 144A), as the offering would otherwise be subject to extremely strict restrictions. They are also used in Europe for some bond placements.

3/ ISSUE DISCOUNTS

Studies show that when a company is floated, its stock often rises by an average of about 10–15% over its issue price, depending on the country, the timing and how the rise is calculated. Meanwhile, shares in a company that is already listed are usually offered at a discount ranging from 2–5%, although the range varies profoundly according to different countries.

This discount is theoretically due to the asymmetry of information between the seller and the investors or intermediaries. One side knows more about the company's prospects, while the other side knows more about market demand. The transaction is therefore possible. It's all a matter of price! Selling securities generally sends out a negative signal, so the seller has to price his securities slightly below their true value to ensure the deal goes through and that investors are satisfied.

The IPO discount could be due to the fact that there are both informed and uninformed investors. Uninformed investors cannot distinguish which issues are really attractive and thus are exposed to the winner's curse. This is why an average discount is offered, to guarantee an appropriate return for uninformed investors who will be receiving many shares of a “bad deal” and few shares of a “good deal”. Others suggest that the discount is a way of remunerating the banks underwriting the deal. The discount makes the issue easier to market, reduces risk and allows them to meet institutional client demand.

The issue discount is another way to persuade investors to invest in a transaction that appears to carry some risk.

For bonds, the investor will generally get a slightly better yield to maturity (5 to 20 basis points) on a new issue than on the secondary market of an existing issue with similar conditions. This premium will be called the new issue premium (NIP), a premium in rate being equivalent to a discount in price.

The greater the asymmetry in information between an issuer and investors, and the lower the liquidity of the security, the greater is the issue discount. The issue discount will thus be high for an initial public offering, less for the sale of shares in an already listed company, low or non-existent for convertible bonds and totally absent for bonds.

So much for the major principles. Let's now look at how the main types of securities are offered. As you will see, the methods converge towards two main techniques: bought deals and book-building.

Section 25.2 INITIAL PUBLIC OFFERINGS

The purpose of this section is not to analyse the motivations, strategic or otherwise, of an IPO (that will be seen in Chapter 44) but simply to describe how it works.

1/ HOW AN IPO WORKS

IPOs are surely the most complex of transactions, taking many months to put in place. They involve selling securities, about which prior information is extremely limited, to a large number of investors, including institutional and retail investors and employees.

An IPO can include a primary tranche (i.e. shares newly issued by the company) and/or a secondary tranche (i.e. disposal of existing shares by an existing shareholder). The techniques are the same for both tranches and, in fact, existing shares and new shares are bundled up in the same lot of shares to be offered. They are fungible.

However, the techniques vary depending on whether the shares are being offered to institutional investors, retail investors or employees.

2/ HOW IPOS ARE MADE

A number of techniques exist for floating a company. However, in the past few years, IPOs on regulated markets have almost all been in the same form: that of an **underwritten deal** with institutional investors and a **retail public offering** with retail investors.

(a) Book-building

Offerings of securities to institutional investors are most often implemented through a book-building. This is the main tranche in almost all IPOs. Under this system, one or more banks organise the marketing and sale of securities to investors via a phase of book-building. The price set after book-building will serve as a basis for setting the price of the retail public offering. Other techniques are used for the other tranches (employees and retail investors, in particular).

The initial **review phase** is handled by the banks. This consists of assessing and preparing the legal and regulatory framework of the deal (choice of market for listing, whether to offer shares in the US, etc.); structuring the deal; supervising documentation (due diligence, prospectus) and underwriting and execution agreements; preparing financial analysis reports; designing a marketing campaign (i.e. the type and content of management presentations, programme of meetings between management and investors).

Then comes the **execution phase**, with the publishing of financial analysis notes by syndicate banks. This is a **pre-marketing** period lasting one to two weeks prior to the effective launch of the operation. The notes are presented to investors during “warm-up” meetings, which help test investor sentiment. Analysts' research notes cannot be published during the blackout period that precedes the launch. The terms of the transaction, particularly the price range or maximum price, are set on the basis of conclusions from this pre-marketing exercise.

The marketing campaign itself then begins, and the offering is under way. During this period, full information is distributed via draft prospectuses (certified by market authorities), which may be national or international in scope. The prospectus includes all information on the company and the transaction. The offering is marketed within a price range of about 15% or with a maximum price. Company managers are mobilised during this period for numerous meetings with investors (roadshows) or for one-on-one meetings. The information given to investors is mainly on company results, markets and strategy.

In the meantime, investor intentions to subscribe in terms of volumes and prices are recorded in an **order book**, on the basis of the preliminary price range.

After this period, which can last 5–15 days, the sale price of the existing shares and/or newly issued shares is set. The price reflects market conditions, overall demand as reflected in the order book and the price sensitivity that investors may have expressed.

Not until after this phase might banks enter into a firm underwriting agreement. The shares are then immediately allocated, thus limiting the bank's risk. After allocation, investors are theoretically committed.

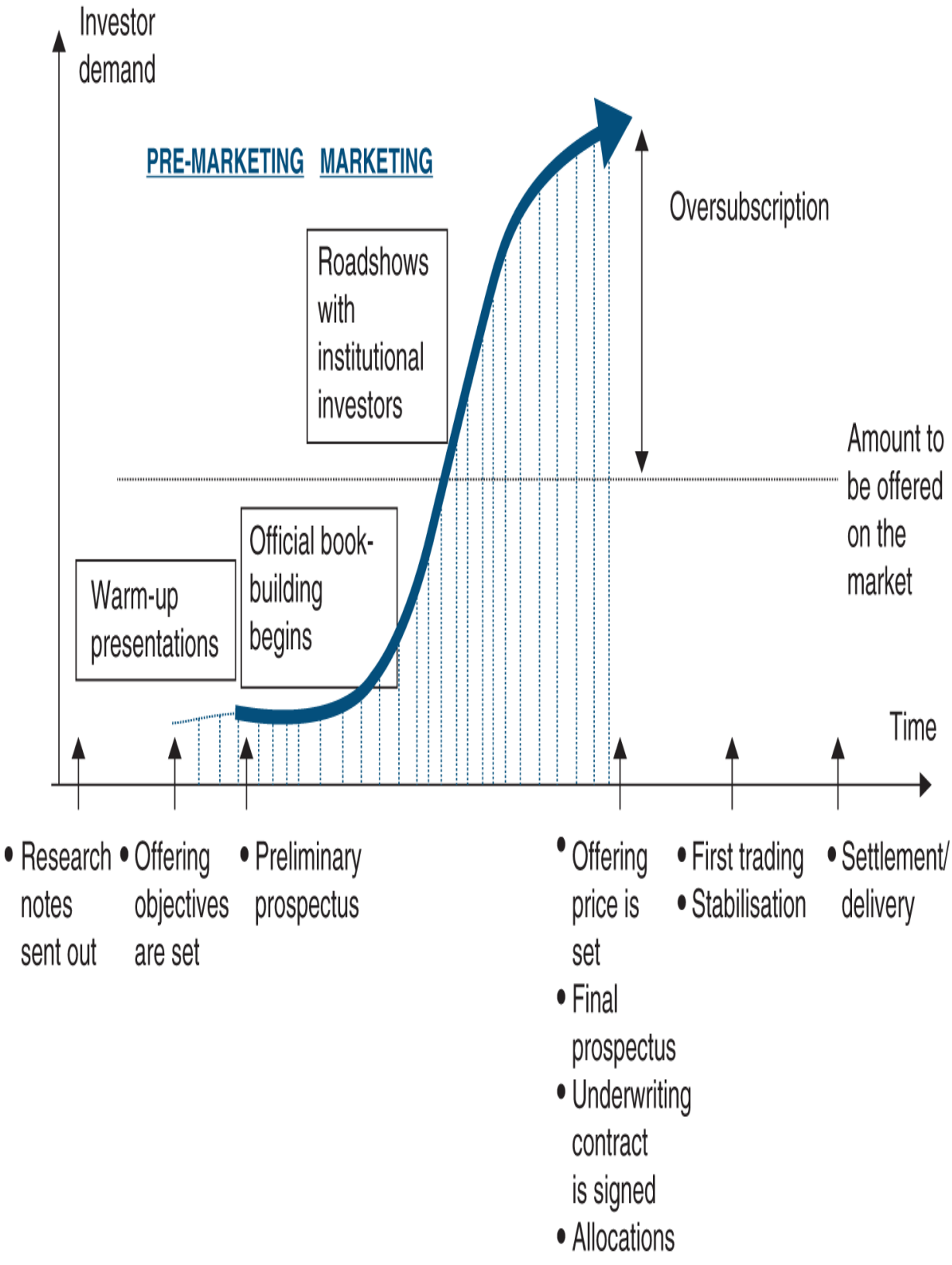
However, up to the actual settlement and delivery of the shares (three days after the transaction), banks still face counterparty risk. There is also business risk in the form of an institutional investor who decides not to take delivery of the shares after all (an agreement is normally found between the bank and the investor). In sum, the only risks the syndicate takes is that of a market crash between the moment the price is set and the moment when the shares are allocated, and that of stabilising the price for around a month after the transaction by buying shares on the market.

The guarantee given by the bank to the company is also implicitly a comforter for the market. The bank determines a value after review of internal information. This partly resolves the problem of asymmetry of information. The signal is no longer negative, because a bank with access to internal information is taking the risk of buying the shares at a set price if the market does not.

A standardised press release (with the issue price) is sent out after the price is set and the subscription period is closed. The lead bank knows the quantity and quality of demand. The book-runner allocates the new shares to investors in concert with the issuer and/or seller, who can thus “choose” its shareholders to a certain extent.

The shares are allocated on the basis of certain criteria determined in advance. Allocation is discretionary but not arbitrary. The goal may be to favour US, European or local investors. Generally, the main goal in allocation is to have a balance between investors with different investment timing in order to ensure a stable aftermarket. The banks may steer the issuer to what it believes are quality investors, thus limiting excessive **flowback**, i.e. the massive sale of securities immediately after the offering.

Book-building



Book-building offers several advantages, including greater flexibility. For one thing, the price can be adjusted as necessary during the marketing phase, which can sometimes last several weeks. Moreover, shareholders can still be chosen via discretionary allocation of shares.

(b) How shares are offered to retail investors

In an underwritten deal, shares are allocated at the discretion of the lead, based on the order book, as well as on criteria announced in advance. However, when shares are being sold to retail investors, the issue is centralised by the market itself.

The retail public offering

In a retail public offering, a price range is set before the offering, but the exact price is set after the offering. The final price reflects market demand. French market authorities, for example, require a marketing period lasting at least three days, after which a draft prospectus is issued with the characteristics of the deal. Based on a price range, financial intermediaries collect orders from investors. The issue price is set jointly by the issuer and the syndicate lead, and is generally equal to the underwriting price.[2] The final prospectus is then approved by the market authorities.

With the agreement of the market authorities, the banks can adjust the price if they have previously reserved the right to do so but, in general, they must begin the process anew if the new price is outside of the initial range. Shares are allocated on the basis of orders if supply is equivalent to demand and can be reduced on the basis of predetermined criteria. Allocation of shares to the various categories of buyers is done on the same basis as the fixed-price offer.

Normally, at least 1% of the order is filled, but there may be provision for a minimum number of shares per order, so that broker fees do not end up swallowing any potential gain. Similarly, there are sometimes several categories of orders with different allocation priorities.

Fixed-price offering

Under a fixed-price offering, a certain number of shares are offered to the public at a pre-set price, which is generally identical to the price offered to institutional investors. The price is set after the book-building phase and is independent of market conditions. It is applied regardless of the number of shares requested. If it is far below what the market is willing to pay, the price will rise sharply in the days after the IPO and primary market buyers will have a capital gain to show for their initiative.

The only difference between a fixed-price offering and a retail public offering is how the price is set.

Minimum-price offering

Under this technique, a number of shares are offered to the public at a certain price, under which they will not be sold. The local stock exchange centralises orders, in which buyers must specify a floor price, and tries to find a sufficiently wide price range at which orders can be allocated in a certain proportion (about 6%) if there is sufficient demand.

In a minimum-price offering, some orders may be shut out entirely, and orders at very high prices are paradoxically eliminated. This explains why the first quoted price is above the pre-set minimum price. If demand is too strong to quote the shares, trading is declared “limit up” and resumes at a higher price, or another technique is used for the initial quotation.

An ordinary full listing

The principle of an ordinary full listing is simple: the shares are offered on the basis of the market's normal trading and quoting conditions. A minimum sale price is set, but buy orders are not centralised by the local stock exchange. Quotation is possible at a price normally no higher than 110% of the minimum price; at least 6% of the buy orders are filled (4% in exceptional cases). As in a minimum-price offering, trading may be suspended “limit up” and resumed at a higher price. In addition, orders may have to be covered by sufficient funds (the goal being to discourage speculation).

3/ US LISTINGS FOR NON-US COMPANIES

Companies normally list their shares on their domestic stock market, where they are better known. However, they may wish to tap foreign investors to widen their shareholder base and could thus seek a foreign listing.

This decision is not so unusual – over 3,000 foreign companies are listed in the US!

Since the American markets (NYSE and Nasdaq) are traditionally the preferred alternative for companies wanting to list, we focus our attention on US listing.

> A company can list its shares on the US market via (1) a private placement, (2) American depositary receipts (ADRs) or (3) a full listing.

(a) Private placements

Under rule 144A, companies may opt for private placement of their shares, but they may only do so with US **qualified institutional buyers** (QIBs). QIBs are then prohibited from selling their shares on the open market for two years, but can trade with other QIBs via the PORTAL system. Private placements are simply a means of gaining access to US investors, but do not allow a company to register its shares with the Securities and Exchange Commission (SEC, the US market regulator) or to quote them in the US.

This is the least restrictive way to raise capital on US markets, as private placements are not registered with the SEC and come under the 12g3-2(b) waiver. All the issuing company has to do is translate the information that it has provided to its domestic market.

(b) Indirect listing via ADR

ADRs, also known as DRs or GDRs,[3] are negotiable instruments issued by a US bank and representing the shares that it has acquired in a foreign company listed on a non-US market – something like tracking stocks, except they are not issued by the company itself. ADRs are traded on a regulated market (Nasdaq or NYSE) or an over-the-counter (OTC) market.

The ADR shares can be established either for existing shares already trading in the secondary market of the home country, or as part of a global offering of new shares.

There are three types of ADR depending on whether the company wishes to be listed on an organised market and raise funds in the US. The disclosure requirements will be more or less onerous depending on the type of ADR.

Nearly 3,000 ADRs are listed from 90 countries, including Sanofi, Telefónica, Korea Electric Power, ArcelorMittal, BP, Alibaba, JD.com, Teva and many others.

(c) Full listing

Companies can also list their ordinary shares in both their home countries and directly in the US. This gives them access to institutional investors whose by-laws do not allow them to buy shares outside the US.

The main difference between ordinary registered shares and ADRs is that ordinary registered shares carry lower transaction costs as there is no depositary. They are also more liquid and less subject to arbitrage trading between domestic shares and ADRs.

Full listing is a relatively long and complex process suitable only for very large companies (UBS, Deutsche Telekom, Repsol YPF, etc.).

Section 25.3 ICOS

An ICO, or initial coin offering, is a fund-raising process for a start-up, frequently in the technology sector and linked to blockchain cryptography. The name is derived from IPO (initial public offering) for marketing purposes, and is similar only in name as it differs quite significantly from the IPO process. To avoid scams, of which there were many during the initial ICO buzz of 2017/2018, market authorities have actively implemented regulations to govern the ICO process.

Start-ups seeking to raise capital will provide in exchange not shares but “tokens”, issued with blockchain technology, which can then be traded on specialised platforms. There are several categories of tokens:

Utility tokens (the most widespread today) that will give access to a good or service in development by the company raising the funds.

Security tokens that resemble financial securities in that they give access to all or part of the company's income and/or dividends.

Community tokens (the first to appear) that give their holders the opportunity to participate in the governance of the project financed by the company.

Asset tokens that represent rights over underlying assets.

A company wishing to carry out an ICO presents its project and the characteristics of its tokens in a document entitled a “white paper” (the equivalent of the prospectus for an IPO). One of the difficulties with ICOs is the valuation of the token. Depending on the characteristics of the token, its value will depend more on the use that will be made of it, or on the income derived from this use.

Section 25.4 CAPITAL INCREASES

A financial approach to capital increases is developed in Chapter 38.

1/ THE DIFFERENT METHODS

The method chosen for a capital increase depends:

on whether or not the company is listed;

on how willing current shareholders are to subscribe.

(a) Listed companies

When the large majority of current shareholders are expected to subscribe to the capital increase and it is not particularly necessary or desirable to bring in new shareholders, the transaction comes with pre-emptive subscription rights (the transaction is then called a rights issue). The issue price of the new shares is set and announced in advance and the offering then unfolds over several days. The price is set at a significant discount to the market price, so that the transaction will go through even if the share price drops in the run up to the listing of new shares. To avoid penalising existing shareholders, the issue comes with pre-emptive subscription rights, which are negotiable throughout the transaction period.

However, when current shareholders are not expected to subscribe or when the company wants to widen its shareholder base, there is no issue of pre-emptive subscription rights. The issue price is then not set until a marketing and pre-placement period has been completed, with a very slight discount to the share price at the end of this period. There are no pre-emptive subscription rights, but there may be a period during which current shareholders are given priority in subscribing.

(b) Unlisted companies

In this case, the issue price's discount will not be dictated by the fear that the share price will fluctuate during the operation (as the company is not listed), but rather by the wish of current shareholders to raise cash by selling the subscription rights they may have received.

If current shareholders do not wish to raise cash, then the company will issue pre-emptive subscription rights at a price about equal to the share price, or may issue shares to identified investors that have been found via a private placement.[4]

WHICH METHOD SHOULD BE USED FOR A CAPITAL INCREASE?

Rights issue subscribed to mainly by:	Listed company	Unlisted company
Current shareholders	Pre-emptive subscription rights Steep discount to the market price	Pre-emptive subscription rights with a steep discount if current shareholders wish to raise cash Pre-emptive subscription rights with no discount or no pre-emptive rights if current shareholders do not want to raise cash
New shareholders	Offer without pre-emptive subscription rights (at a slight discount to the current share price) In some cases, a reserved rights issue	Pre-emptive subscription rights with a steep discount if shareholders want to raise cash Reserved rights issue if shareholders do not want cash

Shares cannot be issued below par value (this is also the case for listed companies). If the share price is below par value, the par value could be reduced by offsetting it against past losses.

2/ RIGHTS ISSUE

A fixed-price rights issue with pre-emptive subscription rights (also called *privileged subscription* or *rights issues*) is the traditional issue preferred by small investors (or their representatives). Such issues acknowledge their loyalty or, conversely, allow them to raise a little cash by selling their subscription rights.

In some countries, such as the US and Japan, rights issues are quite rare, while in Continental Europe they generally have to be sold by rights.

Such issues remain open for at least 10 trading days. Banks underwrite them at a price well below the current share price, generally at a discount of 15–30%, but up to 30–50% when a financial crisis increases the volatility of stocks. No bank will guarantee a price near the current market price, because the longer the subscription period, the greater the risk of a drop in price. It is at this price that the banks will buy up any shares that have not found takers.

A steep discount would be a considerable injustice to existing shareholders, as the new shareholders could buy shares at 20% below the current market price. Rights issues resolve this problem by allowing existing shareholders to buy a number of shares proportional to the number they already have. If existing shareholders use all their pre-emptive rights, i.e. buy the same proportion of new shares as they possess of existing shares, they should not care what price the new shares are offered at.

> The price of the new shares plus the value of the pre-emptive subscription rights is equivalent to the stock's current market value (i.e. its share price if it is listed), owing to the very existence of the subscription rights, even if the price of the new shares is below the current share price.

Even when existing shareholders do not wish to subscribe, the pre-emptive subscription rights keep them from being penalised, as they can sell the right on the first day it is detached.

(a) Definition

> The subscription right is a right attached to each existing share, allowing its holder to subscribe to the new share issue.

The subscription right offers the existing shareholder:

the certainty of being able to take part in the capital increase in proportion with their current stake;

the option of selling the right (which is listed separately for listed companies) throughout the operation. This negotiable right adjusts the issue price to the current share price.

The subscriber may, thanks to their subscription rights, subscribe unconditionally to an amount equivalent to the pro rata of their holdings in the company. Should they wish to subscribe in a greater quantity, they may do so conditionally, provided that other shareholders do not take up their own rights to the subscription. Otherwise, should they seek certainty with regard to their intentions, they will have to purchase the subscription rights from shareholders who do not wish to participate.

The subscription right is similar to a call option whose underlying asset is the share, whose strike price is the issue price of the new shares and whose exercise period is that of the capital increase. Hence, its theoretical value is similar to that of a call option whose time value is very low, given its short maturity.

If the issue price and the current share price are the same, the subscription right's market value will be zero and its only value will be the priority it grants.

If the share price falls below the issue price, the rights issue will fail, as nobody will buy a share at more than its market price. The right then loses all value. Fortunately, the reverse occurs more frequently.

(b) Calculating the theoretical value of the subscription right

Let's take a company that has 1,000,000 shares outstanding, trading at €50 each. The company issues 100,000 new shares at €40 each, or one new share for each 10 existing ones. Each existing share will have one subscription right, and to buy a new share for €40, 10 subscription rights and €40 will be required.

After the new shares have been issued, an existing shareholder who holds one share and has sold his pre-emptive subscription rights must be in the same situation as an investor who has bought 10 pre-emptive subscription rights and one new share. So the share price after the deal should be equal to:

$$\text{Pre-deal price} - 1 \text{ pre-emptive right}$$

but also:

$$\text{Issue price} + 10 \text{ pre-emptive subscription rights}$$

In our example:

$$50 - 1 \text{ subscription right} = 40 + 10 \text{ subscription rights}$$

Hence:

$$\text{The value of the right} = 0.91$$

The post-deal share price should be equal to:

$$50 - 0.91 = 40 + 10 \times 0.91 = 49.09, \text{known as the TERP.}$$

It is easy to calculate the theoretical value of the subscription right:

$$(V - E) \times \frac{N'}{N + N'}$$

where V is the pre-issue share price, E the issue price of the new shares, N' the number of new shares issued and N the number of existing shares.

We can see that this formula can be used to find the previous result.

The detachment of subscription rights is conceptually similar to a bonus share award. Hence, the existing shareholder may, if they wish, sell some pre-emptive rights and use the cash and remaining rights to subscribe to new shares, without laying out new cash (see the exercise at the end of this chapter).

(c) Advantages and drawbacks of pre-emptive rights

The subscription right is valid for at least 10 trading days – a relatively lengthy amount of time. The issue price therefore has to be well below the share price, so that if the share price does fall during the period, the deal can still go through. In such case, the value of the right (i.e. the difference

between the share price and the issue price) will fall but will remain positive, as long as the share price, ex-rights, is above the issue price.

This is a double-edged sword as, once the deal is launched and the rights issued, nothing can delay the capital increase, even if the share price drops significantly during the deal. This is why the initial discount is so significant.

Complicating the transaction further is the fact that shareholders who do not possess a number of shares divisible by the subscription parity must sell or buy rights on the market so that they do. This can be difficult to do on international markets.

Another potential complication is the large proportion of US investors among current shareholders who are sometimes unable to exercise their pre-emptive subscription rights as some are not authorised to invest in options, which subscription rights are.

3/ ISSUE OF SHARES WITHOUT PRE-EMPTIVE SUBSCRIPTION RIGHTS

In issues of shares without subscription rights, the company also turns to a bank or a banking syndicate for the issue. But their role is more important in this case, as they must market the new shares to new investors. They generally underwrite the issue, as described above for IPOs. A retail public offering can be undertaken simultaneously. Alternatively, the bank can simply launch the transaction and centralise the orders without having gone through a book-building phase. The company may issue 10–15% more shares than expected, via a greenshoe, under which warrants are issued to the banks (see 25.1, 2/).

Local regulations tend to limit the flexibility to issue shares without subscription rights, so that the shareholder will not be diluted at an absurdly low price. Therefore, in most countries, regulation fixes a maximum discount to the last price or a minimum issue price as a reference to a price average.

When new shares are issued with no pre-set price, current shareholders can be given first priority without necessarily receiving pre-emptive rights. Indeed, such a priority period is the rule when pre-emptive rights are not

issued. However, priority periods have the disadvantage of lengthening the total transaction period, as they generally last a few trading days (this is the minimum amount of time to allow individual shareholders the time to subscribe).

Legally speaking, a public issue of new shares, with or without pre-emptive rights, is considered to have been completed when the banks have signed a contract on a firm underwriting the transaction, regardless of whether or not the shares end up being fully subscribed.

Such issues of shares can be implemented in the form of a private placement to qualified investors (usually for a minor portion of capital).

4/ EQUITY LINES

The way an equity line works is that a company issues warrants to a bank that exercises them at the request of the company when it needs to raise equity. Equity lines smooth the impact of a capital increase over time. The shares issued when the warrants are exercised are immediately resold by the bank.

Equity lines are suitable for young businesses where the stock performance history does not allow conventional rights issues. However, it opens the way to many uncertainties, particularly on the terms imposed on the banks in exercising warrants and reselling the shares.

5/ RESERVED CAPITAL INCREASE

The placement of securities is infinitely simplified if the capital increase is reserved for a single identified investor. The challenge is then simply to reassure shareholders about the fairness of the issue price of the securities, as the reserved capital increase must be voted on at an EGM with, of course, cancellation of preferential subscription rights.

6/ EMPLOYEE STOCK OWNERSHIP PLANS

Employee Stock Ownership Plans (ESOPs) enable employees to acquire shares in the company they work for via a share placement process. The placement of securities is made directly with employees, generally at the same time as the payment of profit-sharing and incentive schemes, which

makes it possible to finance all or part of the subscription. The company may also offer more structured share subscription mechanisms (downside protection of the share, upside multiplier).

Section 25.5 BLOCK TRADES OF SHARES

A block is a large number of shares that a shareholder wishes to sell on the market. Normally, only a small fraction of a company's shares are traded during the course of a normal day. Hence, a shareholder who wants to sell, for example, 5% of a company's shares cannot do so directly on the market. If he did, he could only do so over a long period and with the risk of driving down the share price. Blocks are sold via book-building and/or bought deals, which were described above.

1/ BOOK-BUILDING AND ACCELERATED BOOK-BUILDING

Like a rights issue or an IPO, a block trade can be done via book-building. However, block trades are “simpler” deals than capital increases or IPOs, the company is already known to the investors as already public and the amount to be placed is smaller. Hence block trades require less marketing. Book-building is faster, top management is less involved or not involved at all, and the deal can sometimes be done within a few hours.

Bigger transactions involving a strategic shift (exit by a controlling shareholder, etc.) may require an intense marketing campaign, and the deal will be managed as if it were a rights issue.

Book-building can come with a public offer of sale when the company wants to allow retail investors to acquire shares, but only for the larger issues. Barring a waiver from Euronext, a retail offering is possible only if it involves at least 10% of the total outstanding shares or at least 20 times the average daily volumes during the previous six months.

Block trades use techniques that are similar to those of IPOs. For example, prices can be set in advance or on the basis of terms set when the offering begins. However, in the latter case, no price range is required (but the price-setting mechanism and the maximum price must be spelled out). In the requisite filings with Euronext, the initiator can reserve the right to withdraw the offer if take-up is insufficient or increase the number of shares on offer by as much as 25% if demand is greater than expected.

2/ BOUGHT DEALS AND BACK-STOPS

When the seller initiates book-building or accelerated book-building, he has no guarantee that the transaction will go through. Nor does he know at what price the deal will be done. To solve this problem, he can ask the bank to buy the shares itself. The bank will then sell them to investors. This is called a “bought deal”.

The bank is then taking a significant risk and will only buy the shares at a discount to the market price. In recent bought deals involving liquid stocks, this discount ranges from 2% to 5%; it was between 10% and 20% mid-2009.

The way it works is this: the seller contacts a few banks one late afternoon after the markets close. They may have mentioned to some banks a few days or weeks beforehand that they might be selling shares, thus ensuring better-quality replies. The seller asks each bank the price it is willing to offer for the shares. Bids must be submitted within a few hours. The seller chooses the bank solely on the basis of price, and the shares are sold that very night. The bank must then organise its sales teams to resell the shares during the night in North America or Asia, taking advantage of the time difference, and then the following morning in Europe.

For the seller, bought deals offer the advantage of being certain that the deal will go through and at the price stated at the moment when it decides whether to sell. There are some disadvantages, however:

the deal will generally be at a greater discount than in accelerated book-building;

share performance can suffer, as the bank that has acquired the shares will want to sell them as quickly as possible, even if that means making the price fall.

In a very hot market, the seller may have the best of both worlds in transactions with a back-stop.

The bank sets up an order book so that the firm can benefit from an increase in share price.

The bank guarantees a minimum price. If all or part of the placement cannot be made at that price, the bank will buy the shares at the back-stop price.

Banks can be very aggressive when seeking to gain the right to execute such transactions in order to build credentials and comfort their ranking in league tables. A number of large transactions (in particular when governments are sellers) have led to heavy losses for investment banks in charge, leading some banks to leave this market altogether, deemed too risky.

Section 25.6 BONDS

As the bond market develops and becomes more international, investors need benchmarks to measure the risk of default by issuers they do not always know very well. Ratings have thus become crucial in bond offerings. The market for companies that do not have a rating from at least one agency is more complex to tap, as it can be closed from time to time (the market for unrated issuers was also closed for several weeks during the Covid-19 crisis). For an offering in the US, the issuer will need to have at least two ratings.

As we mentioned in Chapter 20, the corporate bond market can be separated between companies having a rating of at least BBB (investment grade) and companies rated BB or lower (below investment grade). When they want to issue bonds, the latter must offer higher interest rates. Such bonds are called “high yield”. The investment grade and high yield markets are separate, not just for the issuers, but also for investors and for the investment banks handling the offering. It should be noted, however, that depending on the situation, some issuers rated BB+ or even BB (known as crossovers) may issue with investment grade type documentation.

1/ INVESTMENT GRADE BONDS

The euro switchover naturally gave rise to a pan-European bond market, and has allowed much larger issues than were previously possible on national markets. €1bn issues are no longer rare, and only issues of €10bn or more are exceptional.

> Corporate bonds are generally placed via book-building.

Bond offering techniques have thus evolved towards those used for shares, and market regulations have followed suit. For example, **competitive bidding** has gradually given way to book-building. Competitive bidding consists of a tender from banks. The issuer chooses the establishment that will head up the offering on the basis of the terms offered (mainly price). It thus takes the risk of giving the lead mandate to a bank that is overly aggressive on price. The reason this is risky is that prices of bonds on the secondary market may fall after the operation begins. Buyers will not like

this. Competitive bidding is similar to a bought deal and is often used by state-owned companies.

Other placement techniques exist (but they are usually used by sovereign issuers): Dutch auctions (“reverse auctions”) are one example.

Book-building helps avoid price weakness after launch, as the issue price (or spread) is not pre-set. The lead bank suggests a price range and sounds out investors to see what price they are willing to pay. Presentations to investors, one-on-one meetings and electronic roadshows over the Internet or Bloomberg allow management to present its strategy.

The lead then builds a book of volumes and prices (either rate or spread) offered by each investor interested in the issue. There is little risk of miscalculation, as the issue price is set by the market. The period between when the price is set and the effective delivery of the shares is called the **grey market** (this is also the case for IPOs and rights issues). Bonds are traded on the grey market without, technically, even existing. Transactions on the grey market are unwound after settlement and delivery and the first official quotations. The lead intervenes on the grey market to maintain the spread at which the issue has been priced.

So there are some similarities between share and bond offerings. However, the process is much shorter for bonds and can be extremely short, especially if a company is an investment grade frequent issuer, and if the issue is on its local market. In such case, the placement will be implemented in a few hours with no marketing efforts. The process is longer for a first issue or if the company is targeting a large proportion of international investors.

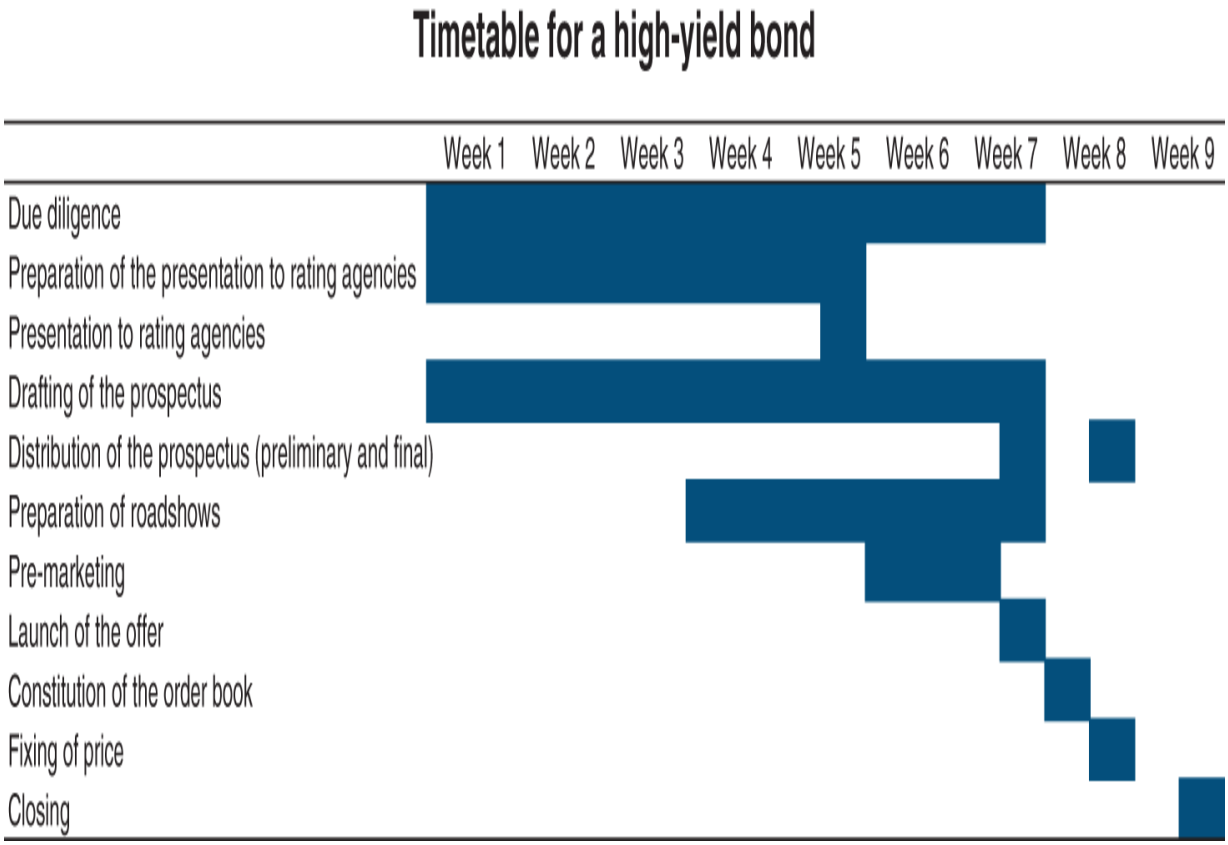
The role of the lead is not just to market the paper, but to advise the client, where applicable, in the obtaining of a rating. It determines the spread possible through comparisons with issuers having a similar profile and chooses the members of the syndicate to help sell the bonds to the largest number possible of investors.

When the company plans several issues in the medium term, it can put out an umbrella prospectus to cover all of them, under an issue of **EMTNs** (**euro medium-term notes**). This allows the company to tap the markets very rapidly when it needs to, or when the market is attractive, at least to

qualified investors, as issues to individual investors are much more cumbersome in terms of documentation.

2/ HIGH YIELD BONDS

By definition, high yield or non-investment grade bonds are risky products. High yield issues take longer and require more aggressive marketing than a standard issue, as there are fewer potential buyers.



3/ PRIVATE PLACEMENT

As explained previously, private placements are an alternative to regular bond issues and allow issues of smaller amounts.

Placement techniques for private placements are much closer to placements of syndicated loans (see Section 25.8) than to standard bond issues. Investors are generally contacted in anticipation of the transaction to gauge their appetite for the transaction and the type of issuer that they could consider. The transaction is then proposed to firms that meet the criteria defined by the investors. Investors are typically insurance companies or

pension funds looking for long-term investment and not caring much about the liquidity of their investment.

The placement requires the drafting of a prospectus as in a standard transaction.

Obviously, each local market (US, European, Schuldschein in Germany) has its specificities. Signs of a structuring market, standard issue contracts are now available for European private placements.

Section 25.7 CONVERTIBLE AND EXCHANGEABLE BONDS

Convertible and exchangeable bonds are issued via accelerated book-building or bought deals.

Convertible bonds (CBs) (examined in Section 24.2) are a very specific product. From a placement point of view, the investor of a convertible bond will benefit from all the information given by the firm to the equity market. In addition, the share price allows the investor to value precisely the option part of the instrument that he will buy.

The asymmetry of information between the investor and issuer in the case of a convertible bond is low, as the bond's convertible component protects the investor.

The only factor that could make an investor hesitate to invest in a convertible bond is the product's complexity. However, CBs are now well known to professional investors, and are sold mainly to specialised investors or hedge funds.

Section 25.8 SYNDICATED LOANS

Syndicated loans are not securities in their own right, but merely loans made to companies by several banks.

A syndicated loan offering is nonetheless similar to a bond issue. The company first receives a proposal from different banks to put in place or (refinance) a syndicated loan. On the basis of these proposals, the firm will retain one (or several) bank(s) that will arrange the transaction (the mandated lead arrangers, or MLAs). MLAs also usually have the role of bookrunners. This bank may do a bought deal of the entire loan and then syndicate it afterwards. The arranger is paid specifically for its advisory and placement role. When a large number of MLAs are retained, some will have a specific role to coordinate the transaction and facilitate the negotiation of the documentation (they are the facilitators, coordinators or agents of the documentation).

The main terms are negotiated between the documentation agent and the company and are put into a **term sheet**. Meanwhile, the bank and company choose a syndication strategy along with the banks (or financial institutions) that will be members of the syndicate.

After meetings with the company and a memorandum of information is drawn up (which can be avoided if the company is public), the banks contacted will decide whether or not to take part in the syndicated loan. Once the syndicate is formed, the legal documentation is finalised.

The entire process can take two months between the choice of arranger and the release of funds.

Syndicated loans are closely dependent on the quality of the company's relationship with its banks. Syndicated loans do not often make much money for the banks, and they take part only as they wish to develop or maintain good relations with a client, to whom they can later market more lucrative transactions (called “side business”). Membership of a syndicate sometimes even comes with the stipulation that it will be remunerated through an implicit or explicit pledge from the company to choose the bank as the lead on its next market transaction or as an advisor on its next M&A deal.

SUMMARY

The summary of this chapter can be downloaded from www.vernimmen.com.

The aim of all types of equity offering is to sell the shares to investors at the highest price at any given time.

To achieve this, the large gap in the quantity and quality of information available to the issuer compared with that available to the investor must be reduced. One of the roles of banks in equity offerings is to inform investors by passing on information obtained from the issuer. The bank has three other roles: it must structure the deal, distribute the securities and generally provide the issuer with a guarantee at a given level.

There are two main types of equity placements:

book-building;

bought deals.

Book-building means that the bank or the banking syndicate will only commit itself to the deal if it knows that there is investor appetite for the shares. Following a phase of dissemination of information to investors, investor intentions to subscribe are recorded in an order book. It is only at this stage that the banks will sign a firm underwriting agreement, thus limiting the risk taken. For a bought deal, the banks will buy the securities from the issuer, and it is up to the banks to place the securities with investors as quickly as possible in order to limit the risk.

Initial public offerings are very complex transactions and involve the dissemination of appropriate information to a variety of investors. Two types of offering exist side by side. There is the underwritten deal, when the banking syndicate places the securities with institutional investors on the basis of the orders recorded in the order book. Generally, a retail public offering is made to retail investors at the same time: in a retail public offering, a price range is set before the offering, but the exact price is set after the offering. The final price reflects market demand. When the offer to retail investors is a fixed-price offer, the issue price is pre-set. Generally identical to the price offered to institutional investors, it is totally independent of the market. Minimum price offerings and full listings using standard market procedures are rarely used these days.

There are two techniques for carrying out equity issues of companies that are already listed, depending on how eager existing shareholders are to subscribe to new shares. There is the fixed-price capital increase with pre-emptive subscription rights, or a capital increase without pre-emptive subscription rights but possibly with a period during which existing shareholders are given priority to subscribe.

For the former, the issue price is set at a significant discount to the market price. In addition, in order to avoid penalising existing shareholders, the issue comes with pre-emptive subscription rights, which are negotiable. Accordingly, the price of the new shares is equivalent to the stock's current market value, even if the price of the new shares is below the current share price. A pre-emptive subscription right is akin to a call option.

A capital increase without a pre-emptive subscription right, for which shareholder approval is required, is an underwritten deal. The issue price is close to the market price. For unlisted companies, capital increases are carried out with or without pre-emptive subscription rights, with defined investors who have been identified following a private placement.

Block trades and issues of convertible bonds are carried out via book-building (or accelerated book-building, which takes only a few hours) or via a bought deal.

The procedure a company uses to issue bonds depends first and foremost on the company being investment grade or not. An investment grade company can issue within a shortened timeframe. For non-investment grade companies, the placement procedure is closer to the capital increase procedure via book-building.

Convertible bonds, despite their apparent complexity, are products that are relatively easy to place as they offer substantial guarantees. They can be sold to investors within a relatively short period.

The procedure for placing a syndicated loan is similar to that for placing a bond issue with a limited number of investors. The banks involved are generally keen to develop a business relationship with the borrower.

QUESTIONS

1/What is a prospectus used for?

2/Describe two different methods used for calculating the value of a subscription right.

3/What financial product can a greenshoe be compared to?

4/Why is the timetable for a first issue for a company issuing a high yield bond much longer than for the issue of a standard bond?

5/Which placement procedure carries the most risk for a bank? Why?

6/Why does it take longer to set up a share issue than a bond issue?

7/Will a shareholder who subscribes to a capital increase with a pre-emptive subscription right become poorer if the share price drops when the subscription right is detached from the share? Why?

8/Which party is the bank that places the shares working for – the issuer or the investor subscribing to the shares?

9/Which is more costly for an issuer – an underwritten deal or a bought deal? Why?

10/Why can convertible bonds be placed so quickly?

11/Immediately after bonds are placed on the market, the price rises. What is the good news for the issuer? And the bad news? Which is the most important?

12/A bank providing an underwriting for an equity issue requests a specific fee to do so. Using the option theory, how can this be analysed?

You'll find more questions at www.vernimmen.com.

EXERCISES

1/In February 2021, Le Furibard carried out an issue of shares with subscription rights. Two new shares were to be issued at a price of A$0.28 for nine existing shares. Before the capital increase, the share was trading at A$0.73.

Calculate the theoretical value of the pre-emptive subscription right.

Calculate the theoretical ex-right price.

If you own 9,000 Le Furibard shares, what should you do before and after the capital increase so that your portfolio remains more or less as it is?

ANSWERS

Questions

1/*For providing investors with a description of the company and the deal which will assist them in making a decision as to whether to invest or not.*

2/*Equation described in the chapter and application of the Black–Scholes equation, which we study in Section 23.5.*

3/*A call option held by the banks and sold by the company.*

4/*Because a bond issued by a below investment grade company carries much more risk than a standard bond. The investor thus needs a lot more information on which to base an investment decision.*

5/*A bought deal, as a risk is taken that the market will change before the shares can be sold.*

6/*Because investors are taking a greater risk by investing in shares than in bonds. Further and better information is needed because of this risk.*

7/*No, because the shareholder was able to acquire shares at a discount to the share price.*

8/*For the issuer, but the bank must also ensure that investors are satisfied with the deal or it may lose its clients!*

9/*A bought deal, because it transfers the risk of the deal failing to the bank, and this has a cost.*

10/*Because a convertible bond provides the same guarantees as a bond, along with the possibility of making the same gains as a share. Investors buying them are thus taking a limited risk.*

11/*Investors will be happy. A lower interest rate could have been paid. If the rise remains reasonable, the former, because it will be possible to retain an open financial market.*

12/*This fee represents the premium of the put option that the firm buys from the bank. Actually, the firm acquires the right to sell to the bank, at the price of the underwriting, the newly issued shares if these are not sold on the market.*

Exercise

A detailed Excel version of the solution is available at www.vernimmen.com.

1/

$$(0.73 - 0.28) \times 2/11 = A\$0.0818.$$

$$0.73 - 0.0818 = A\$0.6482.$$

Sell 3,888 rights for A$318, buy 1,136 new shares with the 5,112 remaining rights plus A$318.08. You would then own 9,000 + 1,136 = 10,136 shares worth A$0.6482 each (or A$657), compared with A$657 for 9,000 shares before the capital increase.

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NOTES

1 *That is, for a flotation on a regulated market or a public retail offer*.

2 *Retail investors are generally offered a discount or are exempt from certain fees*.

3 *American depositary receipts may also be called – generically – depositary receipts (DRs), or Rule 144A depositary receipts or global depositary receipts (GDRs), which are the "private placement" discussed in the text. However, different names typically identify the market in which the depositary receipts are available: ADRs are publicly available to US investors on a national stock exchange or in the OTC market; Rule 144A ADRs are privately placed and resold only to QIBs in the US QIB PORTAL market; GDRs are generally available in one or more markets outside the foreign company's home country, although these may also be known as ADRs.*

4 *In the rare case of a capital increase with no subscription rights and not reserved for identified investors, the price is based on an expert appraisal or is set at book value.*

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Section III
VALUE

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Chapter 26
VALUE AND CORPORATE FINANCE

No, Sire, it's a revolution!

This section presents the concepts and theories that underpin all important financial decisions. In particular, we will examine their impact on value, keeping in mind that basically to maximise a value, we must minimise a cost. The chapters in this section will introduce you to the investment decision processes within a firm and their impact on the overall value of the company.

Section 26.1 THE FINANCIAL PURPOSE OF A COMPANY IS TO CREATE VALUE

1/ INVESTMENT AND VALUE

The accounting rules we looked at in Chapter 4 showed us that an investment is a use of funds, but not a reduction in the value of assets. We will now go one step further and adopt the viewpoint of the financial manager for whom a sufficiently **profitable investment is one that increases the value of capital employed**.

We shall see that a key element in the theory of markets in equilibrium is the market value of capital employed. This theory underscores the direct link between the return on a company's investments and that required by investors buying the financial securities issued by the company.

The true measure of an investment policy is the effect it has on the value of capital employed. This concept is sometimes called “enterprise value”, a term our reader should not confuse with the value of equity (capital employed less net debt). The two are far from the same!

Hence the importance of every investment decision, as it can lead to three different outcomes:

Where the expected return on an investment is higher than that required by investors, the value of capital employed rises instantly. An investment of 100 that always yields 15% in a market requiring a 10% return is worth 150 (100 × 15% / 10%). The value of capital employed thus immediately rises by 50.

Where the expected return on the investment is equal to that required by investors, there is neither gain nor loss. The investors put in 100, the investment is worth 100 and no value has been created.

Where the expected return on an investment is lower than that required by investors, they have incurred a loss. If, for example, they invested 100 in a project that in the end should only yield 6% to perpetuity, then the value of the project is only 60 (100 × 6% / 10%), giving an immediate loss in value of 40.

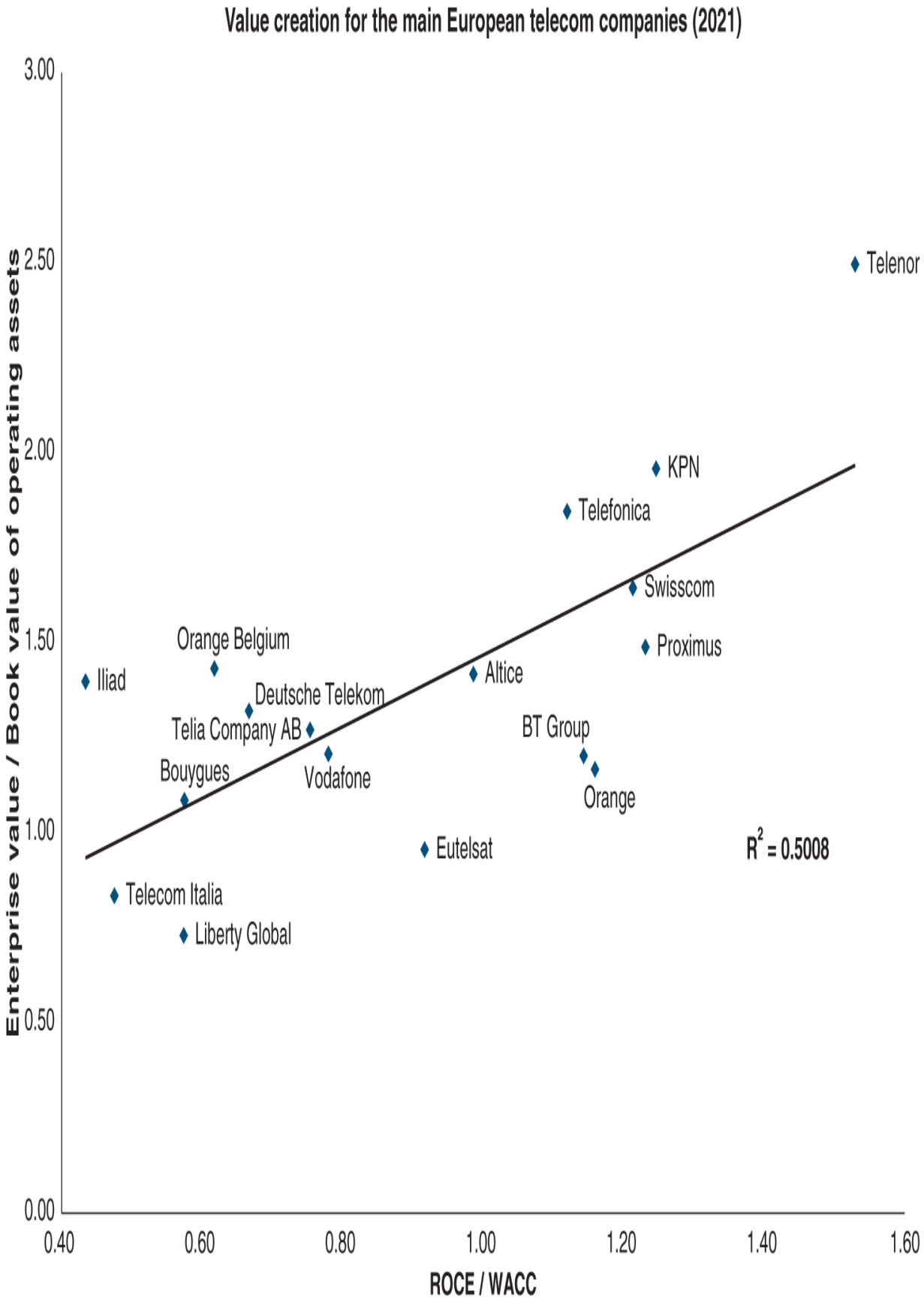
Value remains constant if the expected rate of return is equal to that required by the market.

An immediate loss in value results if the return on the investment is lower than that required by the market.

Value is effectively created if the expected rate of return is higher than that required by the market.

The resulting gain or loss is simply the positive or negative net present value that must be calculated when valuing any investment. All this means, in fact, is that if the investment was fairly priced, then nothing changes for the investor. If it was “too expensive”, the investors take a loss, but if it was a good deal, they earn a profit.

The graph below shows that value is created (the value of capital employed exceeds its book value) when return on capital employed exceeds the weighted average cost of capital, i.e. the rate of return required by all suppliers of funds to the company.


Value creation for the main European telecom companies (2021)
Enterprise value / Book value of operating assets
ROCE / WACC
3.00
2.50
2.00
1.50
1.00
0.50
0.00
0.40
0.60
0.80
1.00
1.20
1.40
1.60
Telenor
KPN
Telefonica
Swisscom
Proximus
Orange Belgium
Iliad
Altice
Deutsche Telekom
Telia Company AB
BT Group
Bouygues
Vodafone
Orange
Eutelsat
R^2 = 0.5008
Telecom Italia
Liberty Global

Source: Data from Exane BNP Paribas

2/ THE RELATIONSHIP BETWEEN COMPANIES AND THE FINANCIAL WORLD

In the preceding chapters we examined the various financial securities that make up the debt issued by a company from the point of view of the investor. We shall now cross over to the other side to look at them from the issuing company's point of view.

Each amount contributed by investors represents a **resource** for the company.

The financial securities held by investors as assets are recorded as liabilities in the company's balance sheet.

And, most importantly, the **rate of return** required by investors represents a financial cost to the company.

At the financial level, a company is a portfolio of assets financed by the securities issued on financial markets. Its liabilities, i.e. the securities issued and placed with investors, are merely a financial representation of the industrial or operating assets. The financial manager's job is to ensure that this representation is as transparent as possible.

What is the role of the investor?

Investors play an active role when securities are issued, because they can simply refuse to finance the company by not buying the securities. In other words, if the financial manager cannot come up with a product offering a risk/reward trade-off acceptable to investors, then the lack of funding will eventually push the company into bankruptcy.

We shall see that when this happens, it is often too late. However, the financial system can impose a sanction that is far more immediate and effective: the valuation of the securities issued by the company.

> The investor has the power not just to provide funds, but also to value the company's capital employed through the securities already in issue.

Financial markets continuously value the securities in issue. In the case of debt instruments, rating agencies assign a credit rating to the company, thus determining the value of its existing debt and the terms of future loans. Similarly, by valuing the shares issued the market is, in fact, valuing the company's equity.

So how does this mechanism work?

If a company cannot satisfy investors' risk/reward requirements, it is penalised by a lower valuation of its capital employed and, accordingly, its equity. Suppose a company offers the market an investment of 100 that is expected to yield 10 every year over a period long enough to be considered to perpetuity.[1] However, the actual yield is only 5 and shows no sign of improvement. The disappointed investors who were expecting a 10% return will try to get rid of their investment. The equilibrium price will be 50, because at this price investors receive a return of 10% (5 / 50) and it is no longer in their interests to sell. But by now it is too late.

Investors who are unhappy with the offered risk/reward trade-off sell their securities, thus depressing the value of the securities issued and of capital employed, since the company's investments are not profitable enough with regard to their risk. True, the investor takes a hit, but it is sometimes wiser to cut one's losses.

In doing so, he is merely giving tit for tat: an unhappy investor will sell off his securities, thus lowering prices. Ultimately, this can lead to financing difficulties for the company, and increased dilution for the shareholder.

The “financial sanction” affects first and foremost the valuation of the company via the valuation of its shares and debt securities.

As long as the company is operating normally, its various creditors are fairly well protected.[2] Most of the fluctuation in the value of its debt stems from changes in interest rates, so changes in the value of capital employed derive mainly from changes in the value of equity. We see why the valuation of equity is so important for any normally developing company. This does not apply just to listed companies: unlisted companies are also affected whenever they envisage divestments, alliances, transfers or capital increases.

The role of creditors looms large only when the company is in difficulty. The company then “belongs” to the creditors, and changes in the value of capital employed derive from changes in the value of the debt, by then generally lower than its nominal value. This is where the creditors come into play.

> The valuation of capital employed, and therefore the valuation of equity, are the key variables of any financial policy, regardless of whether or not the company is listed.

3/ IMPLICATIONS

Since we consider that creating value is the overriding financial objective of a company, it follows that:

A financial decision harms the company if it reduces the value of capital employed.

A decision is beneficial to the company if it increases the value of capital employed.

A word of caution, however! Contrary to appearances, this does not mean that every good financial decision increases earnings or reduces costs.

> Financial short-sightedness consists of failing to distinguish between cost and reduction in value, or between income and increase in value.

Remember, we are not in the realm of accounting, but in that of finance – in other words, value. An investment financed by cash from operations may increase earnings, but could still be insufficient with regard to the return expected by the investor who, as a result, has lost value.

Certain legal decisions, such as restricting a shareholder's voting rights, have no immediate impact on the company's earnings or cash, yet may reduce the value of the corresponding financial security and thus prove costly to the holder of the security.

We cannot emphasise this aspect enough, and insist that you adopt this approach before immersing yourselves further in the raptures of financial

theory.

Section 26.2 VALUE CREATION AND MARKETS IN EQUILIBRIUM

Corporate financial policy consists first and foremost of a set of principles necessary for taking decisions designed to maximise value for the providers of funds, in particular shareholders.

1/ A CLEAR THEORETICAL FOUNDATION

We have just said that a company is a portfolio of assets and liabilities, and that the concepts of cost and revenue should be seen within the overall framework of value. Financial management consists of assessing the value created for the company's fund providers.

Can the overall value of the company be determined by an optimal choice of assets and liabilities? If so, how can you be sure of making the right decisions to create value?

You may already have raised the following questions:

Can the choice of financing alone increase the value of the firm? Is capital employed financed half by debt and half by equity worth more than if it were financed wholly through equity?

Can the entrepreneur increase the value of capital employed – that is, influence the market's valuation of it – by either combining independent industrial and commercial investments or implementing a shrewd financing policy?

If your answer to all these questions is yes, you attribute considerable powers to financial managers. You consider them capable of creating value independently of their industrial and commercial assets.

And yet, the equilibrium theory of markets is very clear:

When looking at valuations, financial investors are not interested in the underlying financial engineering, because they could duplicate such operations themselves. This is called the value additivity rule.

We now provide a more formal explanation of the above rule, which is based on **arbitrage**.

To this end, let us simplify things by imagining that there are just two options for the future: either the company does well or it does not. We shall assign an equal probability to each of these outcomes.

We shall see how the free cash flow of three companies varies in our two states of the world:

FREE CASH FLOW

	State of the world: bad	State of the world: good
A	200	1,000
B	400	500
G	600	1,500

Note that the sum of the free cash flows of companies A and B is equal to that of company G. We shall demonstrate that the share price of company G is equal to the sum of the prices of shares of B and A.[3] To do so, let us assume that this is not the case, and that $V_A + V_B > V_G$ (where V_A, V_B and V_G are the respective share prices of A, B and G).

You will see that no speculation is necessary here to earn money. Taking no risk, you sell short one share of A and one share of B and buy one share of G. You immediately receive $V_A + V_B - V_G > 0$; yet, regardless of the company's fortunes, the future negative flows of shares of A and B (sold) and positive flows of shares of G (bought) will cancel each other out. You have realised a gain through arbitrage.

The same method can be used to demonstrate that $V_A + V_B < V_G$ is not possible in a market that is in equilibrium. We therefore deduce that $V_A + V_B = V_G$. It is thus clear that a diversified company, in our case G, is not worth more than the sum of its two divisions A and B.

Let us now look at the following three securities:

FREE CASH FLOW

Company	State of the world: bad	State of the world: good

Company	State of the world: bad	State of the world: good
C	100	1,000
D	500	500
E	600	1,500

According to the rule demonstrated above, $V_C + V_D = V_E$. Note that security D could be a debt security and C share capital. E would then be the capital employed. The value of capital employed of an indebted company ($V_{(C+D)}$) can be neither higher nor lower than that of the same company if it had no debt (V_E).

The additivity rule is borne out in terms of risk: if the company takes on debt, then financial investors can stabilise their portfolios by adding less risky securities. Conversely, they can go into debt themselves in order to buy less risky securities. So why should they pay for an operation they can carry out themselves at no cost?

This reasoning applies to diversification as well. If its only goal is to create financial value without generating industrial and commercial synergies, then there is no reason why investors should entrust the company with the diversification of their portfolio.

2/ ILLUSTRATION

Are some asset combinations worth more than the value of their individual components, regardless of any industrial synergies arising when some operations are common to several investment projects? In other words, is the whole worth more than the sum of its parts (2 + 2 = 5)?

Or again, is the required rate of return lower simply because two investments are made at the same time?

Company managers are fuzzy on this issue. They generally answer in the negative, although their actual investment decisions tend to imply the opposite. Take Prisma (a publisher of magazines), for example, which was bought by Vivendi in 2021. If financial synergies exist, one would have to conclude that the required rate of return in the magazine publishing industry differs depending on whether the company is independent or part of a

group. Prisma would therefore appear to be worth more as part of the Vivendi group than on a standalone basis.

The question is not as specious at it seems. In fact, it raises a fundamental issue. If the required return on Prisma has fallen since it became part of Vivendi, its financing costs will have declined as well, giving it a substantial, permanent and possibly decisive advantage over its competitors.

Diversifying corporate activities reduces risk, but does it also reduce the rate of return required by investors?

Suppose the required rate of return on a company producing a single product is 10%. The company decides to diversify by acquiring a company of the same size on which the required rate of return is 8%. Will the required rate of return on the new group be lower than (10% + 8%) / 2 = 9% because it carries less risk than the initial single-product company?

We must not be misled into believing that a lower degree of risk must always be matched by a lower required rate of return. On the contrary: **markets only remunerate systematic or market risks, i.e. those that cannot be eliminated by diversification**. We have seen that unsystematic or specific risks, which investors can eliminate by diversifying their portfolios, are not remunerated. Only non-diversifiable risks related to market fluctuations are remunerated. This point was discussed in Chapter 18.

Since diversifiable risks are not remunerated, **a company's value remains the same whether it is independent or part of a group**. Prisma is not worth more now that it has become a division of Vivendi. All else being equal, the required rate of return in the robot sector is the same whether the company is independent or belongs to a group.

On the other hand, Prisma's value will increase if, and only if, Vivendi's management allows it to improve its return on capital employed.

> Purely financial diversification creates no value.

Value is created only when the sum of cash flows from the two investments is higher because they are both managed by the same group. This is the

result of **industrial synergies** (2 + 2 = 5), **and not financial synergies**, which do not exist.

The large groups that indulged in a spate of financial diversifications in the 1960s have since realised that these operations were unproductive and frequently loss-making. Diversification is a delicate art that can only succeed if the diversifying company already has expertise in the new business. Combining investments per se does not maximise value, unless industrial synergies exist. Otherwise, an investment is either “good” or “bad” depending on its return compared to the required rate of return.

In other words, managers must act on cash flows; **they cannot influence the discount rate applied to them** unless they reduce their risk exposure.

> There is no connection between the required return on any investment and the portfolio in which the investment is held.
>
> Unless it can draw on industrial synergies, the value of a company remains the same whether it is independent or part of a large group. The financial investor does not want to pay a premium in the form of lower returns for something he can do himself at no cost by diversifying his portfolio.

3/ A FIRST CONCLUSION

The value of the securities issued by a company is not connected to the underlying financial engineering. Instead, it simply reflects the market's reaction to the perceived profitability and risk of the industrial and commercial operations.

The equilibrium theory of markets leads us to a very simple and obvious rule, that of the additivity of value, which in practice is frequently neglected. Regardless of developments in financial criteria, in particular earnings per share, value cannot be created simply by adding (diversifying) or reducing value that is already in equilibrium.

To ensure a flow of financing, financial managers have to transform their industrial and commercial assets into financial assets. This means that they have to sell the very substance of the company (future risk and returns) in a financial form.

Financial investors evaluate the securities offered or already issued according to their required rate of return. By valuing the company's share, they are, in fact, directly valuing the company's operating assets.

The valuation of the different securities has nothing to do with financial engineering; it is based on a valuation of the company's industrial and commercial assets.

We emphasise that this rule applies to listed and unlisted companies alike, a fact that the latter are forced to face at some point. Capital employed always has an equilibrium value, and the entrepreneur must ultimately recognise it.

This approach should be incorporated into the methodology of financial decision-making. Some strategies are based on maximising other types of value, for example the capability to cause harm to competitors. They are particularly risky and are outside the conceptual framework of corporate finance.

The first reflex when faced with any kind of financial decision is to analyse whether it will create or destroy value. If values are in equilibrium, financial decisions will be immaterial.

Does this mean that, ultimately, financing or diversification policies have no impact on value?

On the contrary, the equilibrium theory of markets represents a kind of ideal that is very useful for the financial professional but, like all ideals, tends to remain out of reach. In a way, it is the paradise that all financial managers strive for, while secretly hoping never to reach such a perfect state of boredom.

Our aim is not to encourage nihilism, merely a degree of humility.

Section 26.3 VALUE AND ORGANISATION THEORIES

1/ LIMITS OF THE EQUILIBRIUM THEORY OF MARKETS

The equilibrium theory of markets offers an overall framework, but it completely disregards the immediate interests of the various parties involved, even if their interests tend to converge in the medium term.

> Paradoxically, the neoclassical theory emphasises the general interest while completely overlooking that of the individual parties.
>
> We cannot rely on the equilibrium theory alone to explain corporate finance.

Since the equilibrium theory demonstrates that finance cannot change the size of the capital employed, but only how it is divided up, it follows that many financial problems stem from the struggle between the various players in the financial realm.

First and foremost we have the various parties providing funding to the company. To simplify matters, they can be divided into two categories: shareholders and creditors. But we shall soon see that, in fact, each type of security issued gives rise to its own interest group: shareholders, preferred creditors, ordinary creditors, subordinated creditors, investors in convertible bonds, etc. Further on in this chapter, we shall see that interests may even diverge within the same funding category.

One example should suffice. According to the equilibrium theory of markets, investing at the required rate of return does not change the value of capital employed. But if the investment is very risky and, therefore, potentially very profitable, creditors, who earn a fixed rate, will only see the increased risk without a corresponding increase in their return. The value of their claims thus decreases, to the benefit of shareholders whose shares increase by the same amount, the value of capital employed remaining the same. And yet, this investment was made at its equilibrium price.

This is where the financial manager comes into play! Their role is to distribute value between the various parties involved. **In fact, the financial manager must be a negotiator at heart.**

But let's not forget that the managers are stakeholders as well. Since portfolio theory presupposes good diversification, there is a distinction between investors and managers, who have divergent interests with different levels of information (internal and external). This last point calls into question one of the basic tenets of the equilibrium theory, which is that all parties have access to the same information (see Chapter 15).

2/ SIGNALLING THEORY AND ASYMMETRIC INFORMATION

Signalling theory is based on two basic ideas:

the same information is not available to all parties: the managers of a company always have more information than investors;

even if the same information were available to all, it would not be perceived in the same way, a fact frequently observed in everyday life.

Thus, it is unrealistic to assume that information is fairly distributed to all parties at all times, i.e. that it is symmetrical as in the case of efficient markets. On the contrary, **asymmetric information** is the rule.

> In short, perfect and equally shared information is at best an objective, and most often an illusion.

This can clearly raise problems. Asymmetric information may lead investors to undervalue a company. As a result, its managers might hesitate to increase its capital because they consider the share price to be too low. This may mean that profitable investment opportunities are lost for lack of financing, or that the existing shareholders find their stake adversely diluted because the company has launched a capital increase anyway.

This is where the **communication policy** comes into its own. Basing financial decisions on financial criteria alone is not enough: managers also have to convince the markets that these decisions are wise.

As a result, pure financial expertise does not suffice if it is not matched by an ability to communicate and to shape market sentiment.

The cornerstone of the financial communications policy is the **signal** the managers of a company send to investors.

Contrary to what many financial managers and CEOs believe, the signal is neither an official statement nor a confidential tip. **It is a real financial decision, taken freely and which may have negative financial consequences for the decision-maker if it turns out to be wrong.**

After all, investors are far from naive and they take each signal with the requisite pinch of salt. Three points merit attention:

Investors' first reaction is to ask themselves why the signal is being sent, since nothing comes for free in the financial world. The signal will be perceived negatively if the issuer's interests are contrary to those of investors. For example, the sale of a company by its majority shareholder would, in theory, be a negative signal for the company's growth prospects. Managers must therefore persuade the buyer of the contrary or provide a convincing explanation for the disposal.

Similarly, owner-managers cannot fool investors by praising the merits of a capital increase without subscribing to it!

However, the market will consider the signal to be credible if it deems that it is in the issuer's interest that the signal be correct. This would be the case, for example, if the managers reinvest their own assets in the company (the signal is even greater if the entrepreneur takes debt to invest).

The reputation of management and its communications policy certainly play a role, but we must not overestimate their importance or lasting impact.

The market supervisory authorities stand ready to impose penalties on the dissemination of misleading information or insider trading. If investors, particularly international investors, believe that supervision is effective, they will factor this into their decisions. That said, some managers may be tempted to send incorrect signals in order to obtain unwarranted advantages. For example, they could give overly optimistic guidance on their company's prospects in order to push up share prices. However, markets catch on to such misrepresentations quickly and react to incorrect signals by piling out of the stock.

In such a context, the “watchdog” role played by the market authorities is crucial and the recent past has shown that the authorities intend to assume it in full. Such rigour is essential if we are to have the best possible financial markets and the lowest possible financing costs for companies.

Financial managers must therefore always consider how investors will react to their financial decisions. They cannot content themselves with wishful thinking, but must make a rational and detailed analysis of the situation to ensure that their communication is convincing.

Signalling theory says that corporate financial decisions (e.g. financing, dividend payout) are signals sent by the company's managers to investors. It examines the incentives that encourage good managers to issue the right signals and discourage managers of ailing companies from using these same signals to give a misleading picture of their company's financial health.

In sum, information asymmetry may lead to a share being priced at less than its objective value, with two consequences:

investments are not maximised because the cost of financing is too high;

the choice of financing is skewed in favour of sources (such as debt) where there is less information asymmetry.

Stephen Ross initiated the main studies in this field in 1977.

3/ AGENCY THEORY

Agency theory says that a company is not a single, unified entity. It considers a company to be a legal arrangement that is the culmination of a

complex process in which the conflicting objectives of individuals, some of whom may represent other organisations, are resolved by means of a set of contractual relationships.

On this basis, a company's behaviour can be compared to that of a market, insofar as it is the result of a complex balancing process. Taken individually, the various stakeholders in the company have their own objectives and interests that may not necessarily be spontaneously reconcilable. As a result, conflicts may arise between them, especially since our modern corporate system requires that the suppliers of funds entrust the managers with the actual administration of the company.

Agency theory analyses the consequences of certain financial decisions in terms of risk, profitability and, more generally, the interests of the various parties. It shows that some decisions may go against the simple criteria of maximising the wealth of all parties to the benefit of just one of the suppliers of funds.

To simplify, we consider that an agency relationship exists between two parties when one of them, the agent, carries out an activity on behalf of the other, the principal. The agent has been given a mandate to act or take decisions on behalf of the principal. This is the essence of the agency relationship.

This very broad definition allows us to include a variety of domains, such as the resolution of conflicts between:

executive shareholders/non-executive shareholders;

non-shareholder executives/shareholders;

creditors/shareholders.

Shareholders give the company executives a mandate to manage to the best of their ability the funds that have been entrusted to them. However, their concern is that the executives could pursue objectives other than maximising the value of the equity, such as increasing the company's size at the cost of profitability, minimising the risk to capital employed by rejecting certain investments that would create value but could put the company in difficulty if they fail, etc.

One way of resolving such conflicts of interest is to use stock options, performance shares (shares offered to management depending on certain targets being reached) or free shares, thus linking management compensation to share performance (see Chapter 43).

Debt plays a role as well, since it has a constraining effect on managers and encourages them to maximise cash flows so that the company can meet its interest and principal payments. Failing this, the company risks bankruptcy and the managers lose their jobs. Maximising cash flows is in the interests of shareholders as well, since it raises the value of shareholders' equity. Thus, the interests of management and shareholders converge. Maybe debt is the modern whip! This is sometimes referred to as “the discipline of debt”.

The diverging interests of the various parties generate a number of costs called “agency costs”. These comprise:

the cost of monitoring managers' efforts (control procedures, audit systems, performance-based compensation) to ensure that they correspond to the principal's objectives. Stock options and free shares represent an agency cost since they are exercised at less than the going market price for the stock;

the costs incurred by the agents to vindicate themselves and reassure the principals that their management is effective, such as the publication of annual reports, the organisation of regular meetings with investors;

residual costs.

The main references in this field are Jensen and Meckling (1976), Grossman and Hart (1980) and Fama (1980). Their research aimed to provide a scientific explanation of the relationship between managers and shareholders and its impact on corporate value.

> Their main contribution is to try and compare financial theory and organisational theory.

This research forms the intellectual foundation on which the concept of **corporate governance** was built (see Chapter 43).

4/ FREE RIDERS

We saw above that the interests of the different types of providers of funds may diverge, but so may those of members of the same category.

> The term “free rider” is used to describe the behaviour of an investor who benefits from transactions carried out by other investors in the same category without participating in these transactions himself.

This means, first, that there must be several – usually a large number – of investors in the same type of security and, second, that a specific operation is undertaken implying some sort of sacrifice, at least in terms of opportunity cost, on the part of the investors in these securities.

As a result, when considering a financial decision, one must examine whether free riders exist and what their interests might be.

Below are two examples:

Responding to a takeover bid: if the offer is motivated by an expectation of synergies between the bidding company and its target, then the business combination will create value. This means that it is in the general interest of all parties for the bid to succeed and for the shareholders to tender their shares. However, it would be in the individual interest of these same shareholders to hold on to their shares in order to benefit fully from the future synergies.

Bank A holds a small claim on a cash-strapped company that owes money to many other banks. It would be in the interests of the banks as a whole to grant additional loans to tide the company over until it can pay them back, but the interest of our individual bank would be to let the other banks, which have much larger exposure, advance the funds themselves. Bank A would thus hold a better-valued existing claim without incurring a discount on the new credits granted.

Section 26.4 HOW CAN WE CREATE VALUE?

Before we begin simulating different rates of return, we would like to emphasise once again that a project, investment or company can only realise extraordinary returns if it enjoys a strategic advantage. The equilibrium theory of markets tells us that under perfect competition, the net present value of a project should be nil. If a financial manager wants to advise on investment choices, he will no doubt have to make a number of calculations to estimate the future return of the investment. But he will also have to look at it from a strategic point of view, incorporating the various economic theories he has learned.

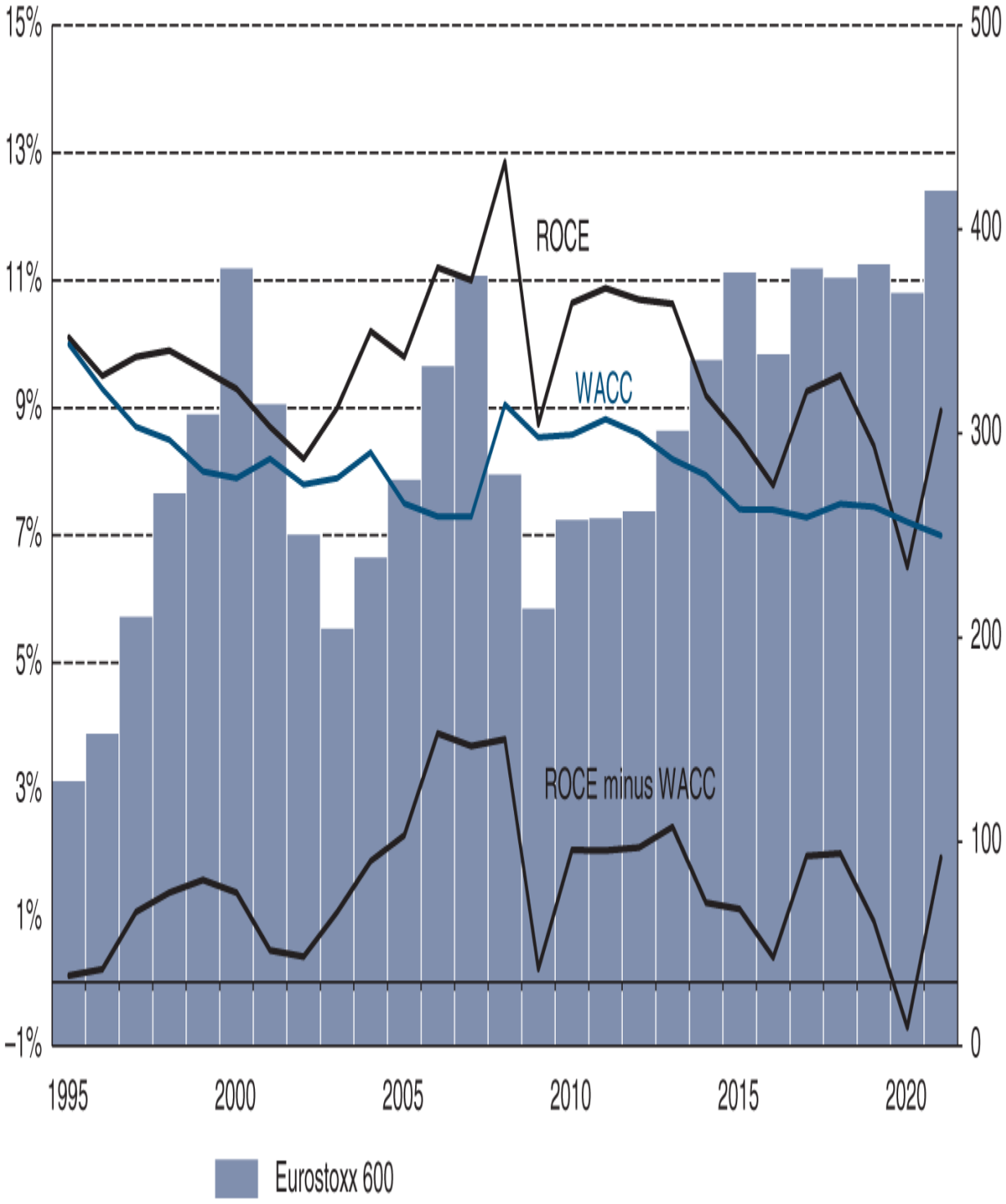
A project's real profitability can only be explained in terms of economic rent – that is, a position in which **the return obtained on investments is higher than the required rate of return given the degree of risk**. The essence of all corporate strategies is to obtain economic rents – that is, to generate imperfections in the product market and/or in factors of production, thus creating barriers to entry that the corporate managers strive to exploit and defend.

> The purpose of a financial strategy is to try to “skew” market mechanisms in order to secure an economic rent.

But don't fool yourself, economic rents do not last forever. Returns that are higher than the required rate, taking into account the risk exposure, inevitably attract the attention of competitors (Tesla) or of the antitrust authorities, as in the case of Google. Sooner or later, deregulation and technological advances put an end to them. There are no impregnable fortresses, only those for which the right angle of attack has not yet been found.

A strategic analysis of the company is thus essential to put the figures in their economic and industrial context, as we explained in Chapter 8.

ROCE, WACC for large listed European groups (left-hand scale)
and stock market prices (right-hand scale)



There is a striking but logical correlation between the evolution of corporate economic rent, measured by the gap between ROCE and the cost of capital (WACC), and stock prices.

Source: Exane BNP Paribas, Factset

We insist on the consequences of a good strategy. When based on accurate forecasts, it immediately boosts the value of capital employed and, accordingly, the share price. This explains the difference between the book value of capital employed and its market value.

Rather than rising gradually as the returns on the investment accrue, the share price adjusts immediately so that the investor receives the exact required return, no more, no less. And if everything proceeds smoothly thereafter, the investment will generate the required return until expectations prove too optimistic or too pessimistic.

Section 26.5 VALUE AND TAXATION

Depending on the company's situation, certain types of securities may carry tax benefits. You are certainly aware that tax planning can generate savings, thereby creating value or more likely preventing the loss of value. Reducing taxes is a form of value creation for investors and shareholders. All else being equal, an asset with tax-free flows is worth more than the same asset subject to taxation.

Better to have a liability with cash outflows that can be deducted from taxes than the same liability with outflows that are not deductible.

This goes without saying, and any CFO will do their best to reduce tax payments, while conforming with the spirit (and not just the strict letter) of the law. Society as a whole is no longer as forgiving of irresponsible behaviour in this domain.

> However, tax optimisation should not merely endeavour to reduce costs if this leads to higher risks. Financial managers must think in terms of value.

They must carefully examine the impact each financial decision will have on taxes.

Our experience tells us that taking a financial decision solely on the basis of tax considerations is rarely the right thing to do. The failure of the AstraZeneca–Pfizer attempted merger, which was mainly based on fiscal considerations, is a good illustration of this.

Section 26.6 A BREAK BEFORE MOVING TO THE NEXT STEP

This chapter is dense and we would advise readers who may be discovering this information for the first time, to reread and meditate on it.

They may have been surprised or shocked to see us define value creation as the financial objective of the company, so much so that this term, which has been popular since the early 1990s, has become a mandatory part of the discourse of most managers, sometimes giving the impression that it is just management speak.

Value creation is not synonymous, as it is sometimes hastily accused of being, with redundancies, plant closures, cost cutting, and neglect of the environment, labour laws and human dignity. Quite the contrary! When we look at the list of groups that have created lasting value for their shareholders, often over very long periods, we immediately see that these are companies that have constantly innovated, grown, created markets, responded to new needs, hired and trained staff, built loyalty, created strong ties with their customers – such as Dassault Systemes, Apple, Tesla, SEB, BMW and so on.

A cost-cutting strategy can only be temporary. It cannot create lasting shareholder value unless it quickly leads to a strategy of profitable growth (as Kraft Heinz has unwillingly demonstrated).

Creating value means avoiding destroying it. In other words, avoiding bad decisions, avoiding the loss through waste of part of a scarce resource which you have been entrusted with, equity, which could have been better allocated elsewhere, and for the benefit of the many. One should avoid penalising personal savings, which have taken risks.

As we have said, and this is one of the main concepts of this chapter, the financial manager thinks in terms of value. Not in cost or profit. In value.

And that changes everything.

Because value encompasses all the financial consequences of decisions, in the short, medium and long term. The financial manager is not there to make a quick deal as a trader would. The long-term consequences of the decisions she takes today do not normally leave her indifferent, because

they have an immediate impact on value. This is an impact that can be mitigated by the mechanics of discounting, but an impact nonetheless.

The financial manager, by joining a company, does not abandon her status as a citizen. To each their role and responsibilities however. In today's environment, the role of the State is to encourage companies, through regulations and taxation, to adopt virtuous behaviour in terms of ecological transition, social responsibility and sustainability. The role of the company is to adapt its strategy, processes and procedures in order to follow that road. The role of the financial manager is to ensure that the commitments made in these and other areas are respected.

It goes without saying that a company may voluntarily be a leader in these areas and do more than is required by regulations. For example, L'Oréal guarantees all its employees worldwide the same level of social protection as in France. And that makes a big difference for Indonesians and Nigerians! But a company still needs to have the economic means to offer this. Today, it is the companies that create value that can afford these types of employment conditions. With the crisis that erupted mid-2020 we will see how many groups still have the resources to implement these voluntary policies.

In the long term, we can imagine that this relationship may be reversed and that it will no longer be possible to create value without first being virtuous, as the majority of consumers, human talent and investors will no longer want to deal with companies that do not respect the environment and are not aware of their social responsibilities. It is no secret, though, that many new editions of the Vernimmen will be published before this becomes a reality.

SUMMARY

The summary of this chapter can be downloaded from www.vernimmen.com.

From a financial point of view, a company's aim is to create value, i.e. it should be able to make investments on which the rate of return is higher than the required rate of return, given the risk involved. If this condition is met, the share price or the value of the share will rise. If not, it will fall. The theory of markets in equilibrium teaches us that it is very difficult to create lasting value. Rates of return actually achieved tend, over the medium term, to meet required rates of return, given technological progress and deregulation, which reduce entry barriers and economic rents that all managers must strive to create and defend, even if sooner or later they will be eliminated. Similarly, diversification or debt cannot create value for the investor who can, at no cost on an individual level, diversify their portfolio or go into debt. Finally, **there is no connection between the required return on any investment and the portfolio in which the investment is held** — value can only be created by industrial synergies. **Financial synergies do not exist.**

It is important to understand that the creation of value is not just the outcome of a calculation of returns. It has an economic basis, which is an economic rent that comes out of a strategy, the purpose of which is to “skew” market mechanisms. Accordingly, the conceptual framework of the theory of markets in equilibrium alone fails to explain corporate finance.

Signal and agency theory were developed to make up for the shortcomings of the theory of markets in equilibrium.

Signal theory is based on the assumption that information is not equally available to all parties at the same time, and that information asymmetry is the rule. This can have disastrous consequences and result in very low valuations or a suboptimal investment policy. Accordingly, certain financial decisions, known as signals, are taken to shake up this information asymmetry. These signals can, however, have a negative financial impact on the party who initiates them if they turn out to be unfounded.

Agency theory calls into question the claim that all of the stakeholders in the company (shareholders, managers, creditors) have a single goal – to create value. Agency theory shows how, on the contrary, their interests may differ and some decisions (related to borrowing, for example) or products (performance shares) come out of attempts at achieving convergence between the interests of managers and shareholders or at protecting creditors. Agency theory forms the intellectual basis of corporate governance.

QUESTIONS

1/Take the examples on page 475 and 476 and give a probability of 50% to the two states of the world. Calculate the value of A, B and G. Calculate the value of C, D and E. What are your conclusions?

2/You offer investors the opportunity to invest 100, financed solely with equity. Assuming that no taxes are payable and projected constant annual profits to perpetuity are 25 (we assume that necessary capital expenditure is equal to depreciation, that change in working capital is nil and that all profits are paid out):

What is the rate of return required by the market on this investment?

The return on this investment only comes to 10 per year. If the required rate of return is not modified, what will the value of this share be on the secondary market?

Same question if the return on the investment is 50 per year? And if profits are nil?

What impact will all of the above scenarios have on the company?

Is it possible to define a simple rule on the creation and destruction of value?

3/What does it mean when a source of financing is cheap?

4/When is value created:

in the choice of investment;

in the choice of financing?

5/You are required to analyse a number of decisions and establish whether or not they will create value. You then have to decide whether value was, in fact, created or transferred on a general level, and, if so, who were the winners and who were the losers?

	Creation of value	**Transfer of value**
Set up an oligopoly Innovate Secure loans at a lower rate than the market rate Improve productivity Reduce income tax		

6/Analyse the following financial decisions. Do they send out positive, negative or neutral signals?

Signal	+	−	=
Sale of company by managing shareholder Sale of company by non-managing shareholder Failure of a managing shareholder who has invested most of his wealth in the company to subscribe to an equity issue Failure of a financial investor to subscribe to an equity issue Increase in the dividend per share (DPS) A family-run company running up very large debts Giving out free shares while maintaining the dividend per share Giving subscription rights to all shareholders at a strike price that is twice the price at which the share is currently trading			

7/What is synergy?

8/Can we talk about financial synergy?

9/What is a conglomerate discount? How can it be avoided?

10/Show how the share price of a very profitable company which invests at a rate of return that is higher than the required rate of return can still drop.

11/Reread Chapter 22 with your new insight into investment policy, especially the link between P/E and PBR, and the rate of return on the investment.

12/Should an investment have a higher expected rate of return than the required rate of return? Generally, will value always be created?

13/Show how the conglomerate discount leads to an increase in the cost of equity.

14/Can a signal be sent if there is no cash flow?

15/What is an economic rent? What is it based on?

16/A company that is close to insolvency carries out a capital increase. Is this a signal? Why? What criteria can you identify as being necessary for a decision to be described as a signal?

17/An increasing number of large groups now ask their top managers to invest a large amount of their personal wealth (often more than 40%) in company shares. What is the theory behind this type of behaviour? Why?

18/Can you explain why the behaviour described in Question 17 could have the secondary effect of encouraging managers to diversify their groups' activities?

You'll find more questions at www.vernimmen.com.

EXERCISE

1/Rawhajpoutalah Intl., an Indian tobacco company, has two divisions, A and B, for which the figures are as follows:

	Division A	Division B
Capital employed	1,000	1,000
Expected return	15%	15%
Net operating income	50	300

What are the values for divisions A and B if you assume, for calculation purposes, that operating income is constant to perpetuity?

The company pays out 50 and so finances its investments for 300. The company invests everything in division B at the same return on capital employed (30%). How much value is created?

Same question if the 300 is invested in division A at the average rate of return of A (5%).

Same question if the 300 is divided equally between A and B.

What are your conclusions?

ANSWERS

Questions

1/$V_A = 600$, $V_B = 450$, $V_G = 1{,}050$; $V_C = 550$, $V_D = 500$, $V_E = 1{,}050$; $V_A + V_B = V_G$, $V_E - V_D = V_C$.

2/

25%.

40.

200; 0.

None.

Value is created when the return is higher than the required rate of return; and vice versa.

3/*That the risk is underestimated by providers of funds.*

4/*In the choice of investment: when an investment is made with a return that is higher than the required rate of return. In the choice of financing: when a company can finance its operations at a lower rate of return than usually required by the market for the same risk.*

5/*Transfer of client value to shareholders. Creation of value. Transfer of creditors' value to shareholders. Creation of value. Creation of value.*

6/*Signal: Negative. Neutral. Neutral. Negative. Positive. Positive. Positive. Neutral.*

7/*Synergy results from a reduction in charges or an improvement in products that leads to the value of the whole being greater than the sum of the values of the parts.*

8/*No, there's no such thing.*

9/*The fact that a conglomerate is worth less than the parts of which it is made up. By dismantling conglomerates.*

10/*This is possible because of an error in anticipation (which was too high at the outset).*

12/*This is the strength of a good corporate strategy, but obviously, if industrial markets are efficient, it is impossible. Macroeconomically, this could be a simple transfer of value between the customers and the shareholders.*

13/*If a conglomerate raises funds of 100 to invest in various assets, and if a discount of 25% is applicable, then the 100 will only be worth 75 and it is at this price that new shares will be issued and not 100. This is where the higher cost of equity comes from.*

14/*No, because a decision based on financial policy is only a signal if it has negative financial consequences for the management which took the decision if the signal turns out to be wrong.*

15/*An economic rent is a situation in which it is possible to obtain a higher return on capital employed than the required rate of return given the risk, on the basis of a special strategic advantage. It is based on a (temporary) lack of equilibrium in the market.*

16/*This cannot be interpreted as a signal because the company has no other choice than to carry out a capital increase if it wishes to avoid bankruptcy. A decision can only be qualified as a signal if it is taken freely and if there is a viable alternative.*

17/*Agency theory, in order to reconcile management's financial criteria with those of the shareholders who have appointed them as managers.*

18/*Because this severely limits the diversification of the personal portfolios of managers, who may wish to make up for this by diversifying the activities in which their groups are involved.*

Exercise

A detailed Excel version of the solutions is available at www.vernimmen.com.

V_A *= 50/0.15 = 333.3;* V_B *= 300/0.15 = 2,000.*

V_A *unchanged;* V_B *= 390/0.15 = 2,600; for 300 reinvested, creation of value = 300.*

V_B *unchanged;* V_A *= 65/0.15 = 433.33; for 300 reinvested, destruction of value = 200.*

V_A *= 57.5/0.15 = 383.33;* V_B *= 345/0.15 = 2,300; for 300 reinvested, creation of value = 50.*

Tendency within conglomerates to spread the investment budget. This does not make for optimal group value.

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NOTES

1 *This strong assumption simplifies the calculation but it does not modify the reasoning*.

2 *Since there is always a risk, their required rate of return comprises a risk premium*.

3 *We are assuming that companies A, B and G have the same number of shares and do not have debt*.

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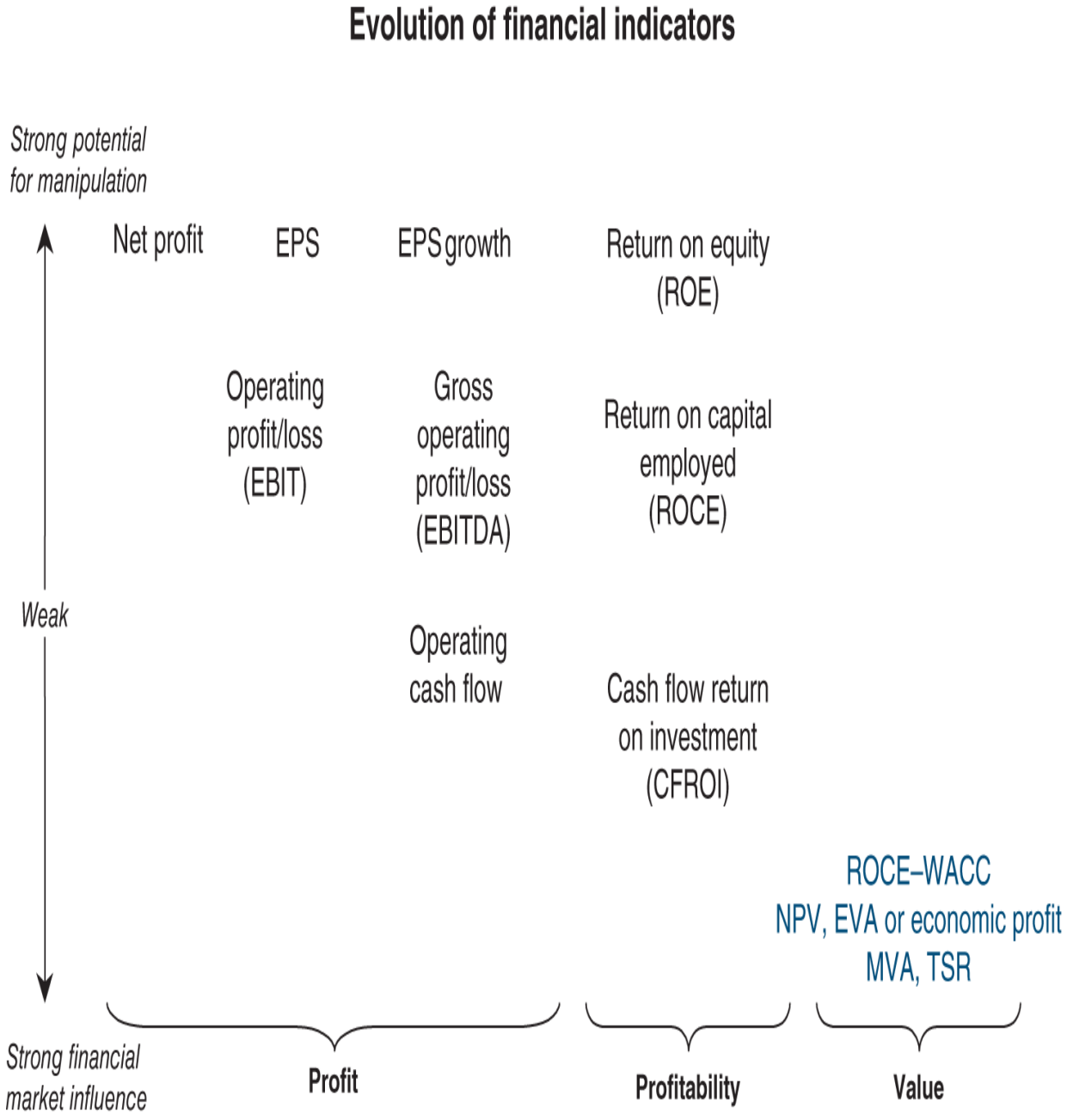
Chapter 27
MEASURING VALUE CREATION

Separating the wheat from the chaff

Creating value has become such an important issue in finance that a host of indicators have been developed to measure it. They come under a confusing array of acronyms – TSR, MVA, EVA, CFROI, ROCE, WACC – but most of these will probably be winnowed out in the years to come. Ultimately, they should be reduced to those few that best mirror and address the recent developments in cash flow statements.

The current profusion of indicators has its advantages, as normally we expect only the most reliable to survive. However, in practice some companies use the lack of clear guidelines and standards to choose indicators that best serve their interests at a given time, even if this involves the laborious task of changing indicators on a routine basis.

The chart below should help you find your way through the maze of indicators. It plots value creation measures according to three criteria: ease of manipulation, sensitivity to financial markets and category (accounting, economic or stock market indicators).



Accounting, financial, hybrid and stock market criteria.

Section 27.1 OVERVIEW OF THE DIFFERENT CRITERIA

Value creation indicators fall into four categories:

Accounting indicators. Until the mid-1980s, companies mainly communicated their **net profit/loss** or **earnings per share (EPS)**. Regrettably, this is a key accounting parameter that is also very easy to manipulate. This practice of massaging EPS is called “window dressing”, or improving the presentation of the accounts by adjusting exceptional items, provisions, etc. The growing emphasis on operating profit or EBITDA represents an improvement because it considerably reduces the impact of exceptional items and non-cash expenses. It is regrettable that the IASB has refused to define EBITDA, which leaves companies free to choose their own definition, whereas for us there is only one: the difference between all operating revenues and expenses that sooner or later results in a cash inflow or outflow; and which has eliminated exceptional items that are now included in the various expense items.

The second-generation accounting indicators appeared as investors began to reason in terms of **profitability**, i.e. **efficiency**, by comparing return with the equity used. One such ratio is called *return on equity* (**ROE**). However, it is possible to leverage this value as well, since a company can boost its ROE by skilfully raising its debt level. Even though ROE might look more attractive, no “real” value has been created since the increased profitability is cancelled out by higher risk not reflected in accounting data.

Since the *return on capital employed* (**ROCE**) indicator avoids this bias, it has tended to become the main measure of economic performance. Only in a few sectors of activity is it meaningless to use ROCE (essentially in banking or insurance, where ROE is widely used).

These rates mainly fall into the field of accounting, rather than finance.

While NPV and other economic indicators represent valuable tools for strategic analysis and a good basis for estimating the market value of companies, they are based on projections that are frequently difficult to assess. Unfortunately, the cash flow for one single year is easy to manipulate and meaningless. Indeed, it is not intuitively interpretable. At the same time, we know that the major drivers of cash flows are the *growth of earnings and revenues* of the company and ROCE. By focusing attention on ROCE, there is a better intuitive grasp of how the company is performing. It is then easier to assess the firm's growth, both over time and relative to its industry.

Accounting/financial indicators emerged with the realisation that profitability per se cannot fully measure value because it does not factor in risks. To measure value, returns must also be compared with the cost of capital employed. Using the cost of financing a company, called the weighted average cost of capital, or WACC,[1] it is possible to assess whether value has been created (i.e. when return on capital employed is higher than the cost of capital employed) or destroyed (i.e. when return on capital employed is lower than the cost of capital employed).

But companies can also go one step further by applying the calculation to capital employed at the beginning of the year in order to measure the value created **over the period**. The difference can then be expressed in currency units rather than as a percentage. This popular measure of value creation has been most notably developed in the **EVA**, or *economic value added*, model. It is also known as **economic profit**.

These indicators are mainly used for decentralised management control and for the calculation of variable compensation, often linked directly or indirectly to economic profit.

Financial indicators. Yet the best of all indicators is undoubtedly *net present value* (**NPV**, see Chapter 16), which provides the exact measure of value created. It has been repeatedly demonstrated that intrinsic value creation is the principal driver of companies' market value. But NPV has one drawback because it must be computed over several periods. For the external analyst who does not have access to all the necessary information, the NPV criterion becomes difficult to handle. The quick and easy solution is to use the above-mentioned ratios. It is important to remember that while the other ratios are simpler to use, they are also less precise and may prove misleading when not used with care.

They are mostly used for investment choices and valuation.

Market indicators: market value added (MVA) and total shareholder return (TSR) are highly sensitive to the stock market. MVA represents the difference on the one hand between the value of equity and net debt, and on the other the book value of capital employed. It is expressed in currency units. TSR is expressed as a percentage and corresponds to the addition of the dividend yield on the share (dividends/value of the share) and the capital gains rate (capital gains during the period divided by the initial share value). It is the return earned by a shareholder who bought the share at the beginning of a period, earned dividends and then sold the share at the end of the period.

A major weakness with these two measures is that they may show destruction in value because of declining investor expectations about future profits, even though the company's return on capital employed is higher than its cost of capital. This is the case for Bic, which has seen its share price drop since 2015, despite having an average ROCE above 12% every year since then, for a cost of capital of roughly 7%. Conversely, in a bull market, a company with mediocre economic performance may have flattering TSR and MVA. In the long term, these highs and lows are smoothed out and TSR and MVA would eventually reflect the company's modest performance. Yet in the meantime, there may be some major divergences between these indicators and company performance.

TSR is sometimes used as an index for variable compensations. MVA is rarely used.

A clear distinction must be made between economic indicators and measures of stock market value creation (TSR and MVA). The former measure the past year's performance, while the latter tend to reflect anticipation of future value creation. The measures of stock market value creation take into account the share price, which reflects this anticipation. Yet the different measures of economic performance and stock market value are complementary, rather than contradictory.

Section 27.2 NPV, THE ONLY RELIABLE CRITERION

It should now be clear that the concept of value corresponds perfectly to the measure of NPV. Financial management consists of constantly measuring the net present value of an investment, project, company or source of financing. Obviously, one should only allocate resources if the net present value is positive; in other words, if the market value is lower than the present value. **Net present value reflects how allocation of the company's resources has led to the creation or destruction of value.** On the one hand, there is a constant search for anticipated financial flows – while keeping in mind the uncertainty of these forecasts. On the other hand, it is necessary to consider the rate of return (*k*) required by the investors and shareholders providing the funds.

The value created is thus equal to the difference between the capital employed and its book value. Book value is the amount of funds invested in the company's operations.

> Creation (or destruction) of value (if negative result) = enterprise value − book value of capital employed.

The creation of value reflects investors' expectations. Typically, this means that, over a certain period, the company will enjoy a rent with a present value allowing its capital employed to be worth more than its book value!

> Here the only valid financial criterion is defined and re-defined: net present value.

While NPV is widely used within companies to make investment choices (Chapter 28), it is hardly ever used by the company in its external communication on its value creation.

If it were to do so, it would be obliged to give precise details of its business plan and future cash flows to the public. No company is prepared to do so in order not to give confidential information to its competitors, nor to give the impression of making performance commitments that it might not keep because it is dependent on economic and financial conditions that are beyond its control.

Hence the development of value creation indicators, which are much less indiscreet, but also often much less effective and much easier to manipulate!

Section 27.3 FINANCIAL/ACCOUNTING CRITERIA

1/ ECONOMIC PROFIT OR EVA

Economic profit is less ambitious than net present value. It only seeks to measure the wealth created by the company in each financial year. EVA does not just factor in the cost of debt, such as in calculating net profit, but also accounts for the cost of equity.

> The innovative aspect of EVA is that it identifies the income level at which value is created. This is because EVA is calculated after deducting the capital charge, i.e. the remuneration of the funds contributed by creditors and shareholders.

Economic profit or EVA first measures the excess of ROCE over the weighted average cost of capital. Then, to determine the value created during the period, the ratio is multiplied by the book value of the**capital employed at the start of the reporting period**. Thus, a company that had an opening book value of capital employed of 100 and an after-tax return on capital employed of 12% with a WACC of only 10% will have earned 2% more than the required rate. It will have created a value of 2 on funds of 100 during the period.

$$\text{EVA} = \text{Capital employed} \times (\text{ROCE} - \text{WACC})$$
$$\text{EVA} = \text{NOPAT} - \text{WACC} \times \text{Capital employed}$$

Economic profit is related to net present value, because NPV is the sum of the economic profits discounted at the weighted average cost of capital:

$$\text{NPV} = \sum_{i=0}^{\infty} \frac{\text{Economic profit}_i}{(1 + \text{weighted average cost of capital})^i} = \sum_{i=0}^{\infty} \frac{\text{EVA}_i}{(1 + \text{WACC})^i}$$

The table shows EVA for some European firms.

Company	2020 EVA (€m)	Company	2020 EVA (€m)
Roche	12,800	Adidas	(26)
Nestlé	6,912	Bonduelle	(39)
L'Oréal	2,831	E.ON	(54)
AstraZeneca	1,164	Heidelberg Cement	(102)
Peugeot	576	Michelin	(312)
Carrefour	278	BASF	(759)
RTL	245	Shell	(974)
Carlsberg	169	LafargeHolcim	(1,222)
Proximus	102	Telecom Italia	(1,913)
Criteo	46	ArcelorMittal	(2,485)
BIC	14	ENI	(3,557)
Heineken	0	Deutsche Telekom	(3,784)

Source: Data from Exane BNP Paribas, Factset

To calculate EVA, it is necessary to switch from an accounting to an economic reading of the company. This is done by restating certain items of capital employed as follows:

The exceptional losses of previous years must be restated and added to capital employed insofar as they artificially reduce the company's capital.

The goodwill recorded in the balance sheet must be taken as gross, i.e. corrected for cumulative amortisation or impairment, the badwill must be deducted from equity and assets.

Other major restatements are for deferred tax liabilities and for depreciation (so as to be consistent with capital employed obtained through previously mentioned restatements).

Of course, the profit and loss account (operating profit/loss and taxes) must be restated to ensure consistency with the capital employed calculated previously.

The firms that develop economic profit tools for companies generally have a long list of accounting adjustments that attest to their expertise. Such accounting expertise typically represents a barrier to entry for others seeking to perform the same analyses.

EVA's novelty also lies in its scope of application, since it enables a company to measure performance at all levels by applying an individual required rate of return to various units. It is a decentralised financial management tool.

> EVA is above all a marketing and communication success story. It rephrases a concept that financial managers have long used, NPV, but explains it in simple and understandable terms at all levels of an organisation.

A firm may be tempted to maximise short-term EVA, which may be detrimental to future EVAs (underinvestment, artificial reduction of working capital). In general, it is very complex to pick annual criteria that will make it possible to measure value creation for a firm properly. Only the NPV of future cash flows allows us to take into account the long-term capacity to create value.

2/ CASH FLOW RETURN ON INVESTMENT

The original version of *cash flow return on investment* (CFROI) corresponds to the average of the internal rates of return on the company's existing investments. It measures the IRR earned by a firm's existing projects.

CFROI is the internal rate of return that equals the company's *gross capital employed*, i.e. before depreciation and adjusted for inflation, and the series of after-tax EBITDA computed over the lifetime of existing fixed assets (estimated by dividing the gross value of fixed assets by the depreciation). CFROI is then compared with the weighted average cost of capital. If CFROI is higher than WACC, then the company is creating value; if it is lower, then the firm is destroying value.

As with EVA, computing CFROI requires a number of restatements, which seem to exist mainly to convince their users to hire the founder of the concept (Holt) to implement it. It is sometimes used in a very simplified manner, which makes it very close to a mere accounting criterion (see Section 27.5).

Section 27.4 MARKET CRITERIA

1/ CREATING STOCK MARKET VALUE (MARKET VALUE ADDED)

For listed companies, *market value added* (MVA) is equal to:

$$\text{MVA} = \text{Market capitalisation} + \text{Net debt} - \text{Book value of capital employed}$$

In most cases, if no other information is available, we assume that net debt corresponds to its book value. Thus, the equation becomes simpler:

$$\begin{aligned}\text{Value created} &= \text{Market capitalisation} + \text{Book value of net debt} \\ &\quad - (\text{Book value of equity} + \text{Book value of debt}) \\ &= \text{Market capitalisation} - \text{Book value of equity}\end{aligned}$$

So, market value added is frequently considered to be the difference between market capitalisation and the book value of equity. This is the equivalent of the price-to-book ratio (PBR) discussed in Chapter 22.[2] The table shows MVA for some large listed European companies.

Company	2020 MVA (€m)	Company	2020 MVA (€m)
Adidas	53,250	NRJ	(170)
ABB	36,716	Peugeot	(533)
Sanofi	36,080	Heidelberg Cement	(1,124)
Deutsche Telekom	35,286	Stellantis	(5,268)
Ericsson	23,974	ENI	(6,594)
Cap Gemini	15,299	Natixis	(7,845)
Total	8,900	Orange	(8,502)
Michelin	6,084	ArcelorMittal	(11,992)
Telefonica	6,056	Renault	(14,197)
Nokia	5,258	Vodafone	(17,735)
Saint Gobain	2,084	NatWest	(20,146)
M6	616	Porsche	(27,309)
Bonduelle	(12)	Crédit Agricole	(28,315)

Source: Data from Exane BNP Paribas, Factset.

It is not complex to demonstrate the relationship between market value added and intrinsic value creation in equilibrium markets, since:

$$\text{Market value added} = \sum_{t=0}^{\infty} \frac{\text{Economic profit}_t}{(1 + \text{WACC})^t}$$

Economic profit being equal to capital employed × (ROCE − WACC). This is also equivalent to:

$$\text{Enterprise value} = \text{Book value of assets} + \sum_{t=0}^{\infty} \frac{\text{Economic profit}_t}{(1 + \text{WACC})^t}$$

However, those who do not believe in market efficiency contend that MVA is flawed because it is based on market values that are often volatile and out of the management's control. Yet this volatility is an inescapable fact for all, as that is how the markets function.

2/ TOTAL SHAREHOLDER RETURN (TSR)

TSR is the return received by the shareholder who bought the share at the beginning of a period, earned dividends (which are generally assumed to have been reinvested in new shares) and values their portfolio with the last share price at the end of the period. In other words, TSR equals (share appreciation + dividends)/price at the beginning of the period.

In order for it to be meaningful, the TSR ratio is calculated on a yearly basis over a fairly long period of, say, 5–10 years. This smooths out the impact of erratic market movements, e.g. the tech, media and telecom stock bubble of 2000, the 2007–2010 or the Covid-19 crisis.

By way of illustration, here is the TSR of a few major groups over the last 10 years.

Company	TSR over 10 years	Company	TSR over 10 years
Apple	30.7%	Rio Tinto	7.6%
L'Oréal	16.2%	Vinci	6.3%
Allianz	11.2%	Total	4.6%
Nestlé	10.5%	ICBC	3.7%
Infosys	10.2%	IBM	1.7%
Enel	10.1%	General Electric	–1.3%
Sanofi	9.4%	Vale	–1.6%
Toyota	9.3%	Nokia	–1.8%
Siemens	9.3%	Santander	–5.7%
Coca-Cola	8.3%	Cathay Pacific	–6.5%

Source: Data from DQYDJ and ycharts

Since markets are not always in equilibrium, there may be times when the creation of both intrinsic value and market value is not automatically correlated. This is particularly true during bust (or boom) periods, when a company may earn more than the cost of its capital and yet still see the market value of its capital employed collapse.

Section 27.5 ACCOUNTING CRITERIA

Certain accounting indicators, like net profit, shareholders' equity and cash flow from operations, are more representative of a firm's financial strength. As such they are flawed to measure value creation.

Earnings per share and the accounting rates of return (ROCE, ROE), whilst systematically used as analytical criteria for all financial decisions, even at the board level, are not without faults as they largely ignore risk due to their accounting origin.

It is inappropriate to believe that by artificially boosting them you have created value. Nor is it correct to assume that there is a constant and automatic link between improving these criteria and creating value. In order to maximise value, it is simply not enough to maximise these ratios, even if they are linked by a coefficient to value or the required rate of return.

1/ EARNINGS PER SHARE

Notwithstanding the comments just made about earnings per share, many financial managers continue to favour using it, especially with regard to financial communication. Despite its limitations, it is still the most widespread multiple because it is directly connected to the share price via the price/earnings ratio. EPS's popularity is rooted in three misconceptions:

the belief that earnings per share factors in the cost of equity and, therefore, the cost of risk;

the belief that accounting data influence the value of the company. Changing accounting methods (for inventories, depreciation, goodwill, etc.) will not modify the company's value, even if it does change earnings per share; and

the belief that any financial decision that lifts EPS will change value as well. This would imply that the P/E ratio[3] remains the same before and after the financial decision, which is frequently not the case. Thus, value is not a direct multiple of earnings per share, because the decision may affect investors' assessment of the company's risks and growth potential.

Consider Company A, which, based upon its risks and growth and profitability prospects, has a P/E ratio of 20. Its net profit is 50. Company B has equity of 450 with net profit of 30, giving it a P/E of 15. Company A decides to acquire a controlling interest in Company B, paying a premium of 33% on B's value, i.e. a total of 600. Company A finances the acquisition entirely by taking on debt at an after-tax cost of 3%. Both Companies A and B are fairly valued. There are no industrial or commercial synergies that could increase the new group's earnings, and no goodwill.

Company A's net profit is thus:

Former net profit of A:	50
+ Net profit of B:	30
− Cost of financing:	18 = 600 × 3%
= New net profit of A:	62, or +24%

Since A financed its acquisition of B entirely through debt, it still has the same number of shares. The increase in earnings per share, also called earnings per share accretion, is therefore equal to that in net profit; that is, +24%. This certainly seems like an extraordinary result!

But has A really created value by buying B?

The answer is no, since there are no synergies to speak of between A and B. Keep in mind that A paid 33% more than B's equilibrium price. In fact, Company A has destroyed value in proportion to this premium, i.e. 150, because it cannot be offset by synergies.

In fact, the explanation for the – apparent – paradox of a 24% rise in earnings per share matched by a destruction of value is that **the buyer's EPS has increased, because the P/E ratio of the company bought by means of debt is higher than the after-tax cost of the debt**. Here, B has a P/E ratio of 20 given the 33% premium paid by A on the acquisition. The inverse of 20 (5%) is much higher than the 3% after-tax cost of the debt for A.

> At the present low interest rates (close to 2% pre-tax, 1.5% net of taxes), an acquisition paid in cash must be based on a P/E ratio of more than 40 to have a negative impact on the EPS[4] of the buyer. Such a situation leaves plenty of margin to manoeuvre.

Consider now Company C, which has equity of 1,400 with net profit of 140, i.e. a P/E of 10. It merges with Company D, which has the same risk exposure, equity of 990 and a P/E of 18 (net profit of 55), with no control premium. Thanks to very strong industrial synergies, C is able to boost D's net profit by 50%. Without doubt, value has been created. And yet, it is not difficult to prove (see Exercise 1) that C's EPS dropped 7% after the merger. This is a mechanical effect due simply to the fact that D's P/E of 18 is higher than C's P/E of 10, because D has better earnings prospects than C.

> At the risk of being repetitious, a word of warning about the widespread fallacy that EPS growth equals value creation. This has led to the misconception that, accordingly, EPS dilution means that value has been destroyed. This is generally wrong as EPS is an accounting metric, not a measure of value.

So, what was the net result of Company C's acquisition of Company D? **The question is not whether Company C's EPS has been enhanced or diluted, but whether it paid too much for D.** In fact, it did not, since there was no control premium paid and industrial synergies were created. After the operation, C's share will trade at a higher P/E ratio, as it should enjoy greater earnings growth thanks to the contribution from D's higher-growth businesses. In the end, C's higher P/E ratio should more than compensate for C's diluted EPS, lifting the share price. This is only logical considering that the industrial synergies created value.

> In fact, EPS can be a reliable indicator of value creation under three conditions only:
>
> the risk on capital employed remains the same from one period to the next, or before and after operations such as mergers, capital increases or share buy-backs, investments, etc.;
>
> earnings growth remains the same before and after any given operation; and
>
> the company's financial structure remains the same from one period to the next, or before and after a given operation.

If these three conditions are met, we can assume that EPS growth reflects the creation of value, and EPS dilution the destruction of value.

If just one of these conditions is lacking, then there is no way to infer that any increase in EPS reflects the creation of value, nor that a decrease is a destruction of value. In our example of a combination between A and B financed by debt, although A's EPS rose 24%, its risk increased sharply. Its position is no longer directly comparable with that before the acquisition of B.

Similarly, C's post-merger EPS cannot be compared with its EPS prior to the merger. While the merger did not change its financial structure, C's growth rate after the merger with D is different from what it was beforehand.

2/ EARNINGS PER SHARE ADJUSTED FOR THE COST OF CARBON EMISSIONS

Used for the first time by Danone in February 2020, this adjusted EPS makes the cost of the carbon footprint visible in financial performance. It measures the accounting enrichment of the shareholder, in relation to one share, once the cost of the carbon credits that the company would have to acquire to offset its greenhouse gas emissions is taken into account. Danone has estimated them on the basis of a cost of €35 per tonne of carbon.

The cost of the externalities that the company causes to the community is thus integrated into the company's financial performance, thus finally linking the two worlds of finance and non-finance.

At a constant cost of carbon credits, this EPS will grow faster than traditional EPS for companies that reduce their carbon footprint, which should enable investors to value them better. It is simply calculated from the net profit (group share) used to calculate EPS, from which the estimated greenhouse gas emissions multiplied by the price per tonne of carbon is subtracted, before dividing the balance by the number of diluted shares.

Once this calculation has been made, there is no reason why the other value creation indicators presented in this chapter cannot be adjusted in the same way.

It may be that the current EPS adjusted for carbon costs will not ultimately be the criterion retained by the market or the most relevant, but we have to start somewhere … and someone has to start.

3/ ACCOUNTING RATES OF RETURN

Accounting rates of return comprise:

return on equity (**ROE**);

return on capital employed (**ROCE**), which was described in Chapter 13; and

cash flow return on investment (**CFROI**), the simplified version of which compares EBITDA with gross capital employed, i.e. before amortisation and depreciation of fixed assets.

$$\text{CFROI} = \frac{\text{EBITDA}}{\text{Capital employed}}$$

This ratio is used particularly in business sectors wherein charges to depreciation do not necessarily reflect the normal deterioration of fixed assets, e.g. in the hotel business.

The main drawback of accounting rates of return on equity or capital employed is precisely that they are accounting measures. As shall be demonstrated below, these have their dangers.

Consider[5] Company X, which produces a single product and generates a return of 20% on capital employed amounting to 100. X operates in a highly profitable sector and is considering external growth opportunities. Should it expect the present 20% rate of return to be generated on other possible projects? If it does, X will never invest because it is unlikely that any other investments will meet these criteria.

How can this problem be rationally approached? The company generates an accounting return of 20%. Suppose its shareholders and investors require a 10% return. Its market value is thus 20 / 10%,

or 200.

The proposed investment amounts to 100 and generates a return of 15% on identical risks. The required rate of return is constant at 10%. We see that:

Present operating profit	20% × 100 = 20
+ Operating profit on new investment	15% × 100 = 15
= Total	35

This yields an enterprise value of 35 / 10% = 350 (+150), with a return on capital employed of 35 / 200 = 17.5%.

The value of the capital employed has increased by more than the amount invested (150 vs. 100), because the profitability of Company X's investment (15%) is higher than the rate required by its shareholders and investors (10%). Value has been created, and X was right to invest. And yet, the return on capital employed fell by 20% to 17.5%, demonstrating that this criterion is not relevant.

In general, if the investment yields more than the required rate of return, then the increase in the value of the company will exceed that of the sums invested.

The inverse example is Company Y, which has a return of 5% on capital employed of 100. Assuming the shareholders and investors require a 10% return as well, the value of Y's capital employed is 5 / 10% = 50.

The proposed investment amounts to 25 and yields a return of 8%. Since we have the same 10% required return, we get:

Present operating profit	5% × 100 = 5
+ Operating profit of new investment	8% × 25 = 2
= Total	7

This results in capital employed being valued at 7 / 10% = 70 (+20), with a return of 7 / 125 = 5.6%.

The value of Y's capital employed has indeed increased by 20, but this is still less than the increase of 25 in capital invested. Value has been destroyed. The return on the investment is just 8%, whereas the required rate is 10%. The company has lost money and should not have made the investment. And yet the return on capital employed rose from 5% to 5.6%.

Similarly following an acquisition financed with a share issue, one could demonstrate that ROE increases when the target company's reverse 1 / (P/E) is higher than the buyer's current ROE.

Financial managers should approach book rates of return with caution. These ratios are accounting measures, but not external measures. They assume that the company is operating in a closed system! The minimum criterion should be the return required by the financial system.

Setting aside all these accounting concepts, to focus on financial concepts, such as requested rates of return (*k*).

Unfortunately, some corporate managers continue to view decision-making in terms of the impact on accounting measures (EPS and accounting profitability), even though it has just been demonstrated that these criteria have little to say about the creation of value. **True, accounting systems are a company's main source of information. However, financial managers need to focus first and foremost on how financial decisions affect value.**

Let's discuss synergy effects before mentioning EPS accretion!

Section 27.6 SYNTHESIS

As long as performance measures and their implementation remain so diversified, it is vital to have a good understanding of their respective flaws. By choosing one or another measure, companies can present their results in a more or less flattering light. Financial managers typically choose those measures that will demonstrate the creation, rather than the destruction, of value.

	Financial criteria		Financial/accounting criteria		Accounting criteria		Market criteria
Ratio	**Net present value**	**Economic profit**	**Cash flow return on investment**	**Earnings per share**	**Accounting rates of return**	**Market value added**	**Total shareholder return**
Acronym	**NPV**	**EVA**	**CFROI**	**EPS**	**ROE, ROCE**	**MVA**	**TSR**
Strengths	The best criterion	Simple indicator leading to the concept of weighted average cost of capital	Not restricted to just one year	Historical data; simple	Simple concepts	Astoundingly simple; reflects total rather than annual value created	Represents shareholder return in the medium to long term
Weaknesses	Difficult to calculate for an external analyst	Restricted to one year; difficult to evaluate changes over a period of time	Complex calculations	Does not factor in risks; easily manipulated; does not factor in the cost of equity	Accounting measures, thus do not factor in risks; restricted to one year; to be significant, must be compared with the required rate of return	Subject to market volatility; difficult to apply to unlisted companies	Calculated over too short a period; subject to market volatility

SUMMARY

The summary of this chapter can be downloaded from www.vernimmen.com.

The tools used for measuring creation of value can be classified under four headings:

Net present value is the only true **financial tool** for measuring value creation.

Financial/accounting tools, which factor in returns required by investors (the weighted average cost of capital) and do not depend directly on the sometimes erratic price movements of markets. EVA, the popular term for economic profit, measures how much the shareholder has increased their wealth over and above standard remuneration. However, EVA has the drawback of being restricted to the financial period in question; EVA can thus be manipulated to yield maximum results in one period at the expense of subsequent periods.

Market tools, which measure the difference between the company's enterprise value and its book value (MVA, market value added), or the rate of shareholder return given the increase in the value of the share and the dividends paid out (TSR, total shareholder returns). These market tools are only useful over the medium term, because to be meaningful they should avoid the market fluctuations that can distort economic reality.

Accounting indicators, which have the main drawback of being designed for accounting purposes, i.e. they do not factor in risk or return on equity. They include earnings per share (EPS) linked to the value of the share by the price/earnings ratio (P/E ratio), shareholders' equity linked to the value of the share by the price-to-book ratio (PBR), accounting profitability indicators (shareholders' equity, return on equity (ROE), return on capital employed (ROCE)) to be compared with the cost of equity (or the weighted average cost of capital, WACC).

A thorough understanding of the weaknesses of all of these tools is vital. Given the lack of a generally accepted standard measure for value creation, companies quite naturally rely on those criteria that show them off in the best light.

QUESTIONS

1/What is the main drawback of accounting profitability indicators?

2/Why do EVA adversaries describe it as a great marketing stunt?

3/What is a TSR calculated over one year?

4/Will a company that is making losses record positive economic profits or EVA?

5/Can a company with a positive net profit show a negative economic profit?

6/What is the sum of future EVA discounted to the cost of capital equal to?

7/Subject to what conditions is it possible to compare EPS before and after a deal?

8/What is your view of this quotation: “A series of positive EVA can only be a sign of two things: either of a monopoly that is more or less temporary (for example, a high-tech development) or a poor estimation of the cost of capital”?

9/Is a drop in return on equity synonymous with value destruction? Why?

10/Is a drop in ROCE synonymous with value destruction? Why?

11/Can a company create value and have a negative TSR over one year? And over 10 years?

12/What does TSR correspond to in terms of investment choice?

13/If you were stranded on a desert island with only one criterion for measuring value creation, which would you want to use? Why?

14/If EPS drops after an acquisition, a disposal, does this necessarily imply value destruction?

15/If EPS rises after an acquisition, a disposal, does this necessarily imply value creation?

16/Why does an accurate calculation of EVA or profitability mean that the balance sheet will have to be restated?

17/What is the drawback of company rankings based on EVA?

18/Do layoffs systematically lead to value creation?

19/Can value be created by developing new products and new markets or by reducing costs?

20/The hotel chain CIGA provides information to the market on value creation, measured by a ROCE calculated as the ratio between EBITDA and the historic value (i.e. gross before depreciation and amortisation) of capital employed. State your views.

You'll find more questions at www.vernimmen.com.

EXERCISES

1/Show that in the example on page 499, C's EPS drops by 7% after the company merges with D.

2/Use the figures provided in Section I (Chapters 4 and 9) and calculate the EVA and the MVA of ArcelorMittal in 2020. The weighted average cost of capital of ArcelorMittal is 10% and it has a market capitalisation of $28.480m. Suppose the tax rate is 25% due to losses. Are you surprised that the ArcelorMittal MVA was negative?

ANSWERS

Questions

1/*The very fact that they are accounting indicators and not part of the realm of value, since they do not factor in risk or the cost of equity.*

2/*Take a concept that has existed for years, give it a new trendy name and the full media treatment and you've got EVA.*

3/*Intellectual trickery! TSR only means something if it is calculated over at least five years in order to eliminate extreme market movements.*

4/*No, because since it is making losses, it does not cover the cost of equity.*

5/*Yes, if net profits do not cover the cost of equity.*

6/*NPV.*

7/*Subject to the risk of capital employed, the capital structure and the growth rate remaining the same before and after the operation.*

8/*It is quite true given the pressure from the competition.*

9/*Not necessarily, if there is a simultaneous drop in risk (capital employed, capital structure) and an improvement in growth prospects. If not, then yes.*

10/*Same answer as for Question 9 above.*

11/*Over one year, yes. Much less likely over 10 years, since sudden fluctuations in prices that are not linked to the company's economic performance are set off against each other.*

12/*The internal rate of return (IRR).*

13/*Net present value, which is the best criterion.*

14/*Not necessarily, if the growth rate after the deal is higher than before or if the risk related to capital structure and capital employed is reduced. If not, then yes.*

15/*Not necessarily, if the growth rate after the deal is lower than before or if the risk related to capital structure and capital employed is increased. If not, then yes.*

16/*In order to get away from the formal constraints of accounting, which are heavily influenced by the principle of conservatism, and to think more in terms of economic value.*

17/*It focuses on an annual indicator and does not factor in an investment policy which could take over a year to yield results.*

18/*No, on the contrary, the creation of value is built on the development of new products and new markets, which leads to an increase in headcount.*

19/*In theory, by creating new products and markets, because the sky is the limit! Reducing costs is less effective as all possible cost-cutting options are soon exhausted.*

20/*ROCE is usually calculated on the basis of operating profit/capital employed (in net book value, i.e. after depreciation and amortisation). CIGA calculates the numerator and the denominator after depreciation and amortisation, which is explained by the highly asset-based nature of its activity – a hotel is not written down economically even if it has been fully amortised.*

Exercises

A detailed Excel version of the solutions is available at *www.vernimmen.com*.

1/*Profits rise from 140 to 140 + 55 + 27.5 = 222.5, or a multiplication by 222.5 / 140 = 1.59. The number of C's shares increases by 990 / 1400 = 70.7%, since D is paid in C's shares, or a multiplication by 1.707. EPS is multiplied by 1.59 / 1.707 = 93%, or a drop of 7%.*

2/*EVA 2020 = 2020 operating profit × (1 − tax rate) − capital employed × 10% = 0.5 × (1 − 25%) − 48.2 × 10% = −$4.5bn. MVA 2020 = 28.5 − 34.2 = −$5.7bn.*

No as the ROCE of ArcelorMittal is below its cost of capital for several years (see Chapter 13).

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NOTES

1 *See Chapter 29. Cost of capital is the weighted average cost of financial resources (equity and debt) available for the firm. It is therefore the minimum return that the company shall provide in order to satisfy the fund providers and hence create value.*

2 *The market-to-capital ratio is a variation of MVA expressed as a ratio rather than a unit amount, because it is obtained by dividing the market capitalisation of debt and equity by the amount of capital invested*.

3 *The P/E ratio is equal to price/earnings per share. It measures the relative expense of a share*.

4 *Before goodwill accounting*.

5 *To simplify the discount calculation, we assume that the planned investments will generate a return to infinity*.

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Chapter 28
INVESTMENT CRITERIA

Back to flows and financial analysis

The “mathematics” we studied in Chapters 16 and 17, dealing with present value and internal rate of return, can also be applied to investment decisions and financial securities. These theories will not be covered again in detail, since the only real novelty is of a semantic nature. In the sections on financial securities, we calculated the yield to maturity. The same approach holds for analysing industrial investments, whereby we calculate a rate that takes the present value to zero. This is called the internal rate of return (IRR). **Internal rate of return and yield to maturity are thus the same.**

This chapter will discuss:

the cash flows to be factored into investment decisions, which are called **incremental cash flows**; and

other investment criteria, which are less relevant than NPV and IRR and have proven disappointing in the past. As financial managers, you should nevertheless be aware of them, even if they are more pertinent to accounting work than financial management: payback period, accounting rate of return, profitability indicator.

Section 28.1 THE PREDOMINANCE OF NPV AND THE IMPORTANCE OF IRR

Each investment has a **net present value (NPV), which is equal to the amount of value created**. Remember that the net present value of an investment is the value of the positive and negative cash flows arising from an investment, discounted at the rate of return required by the market. The rate of return is based upon the investment's risk.

From a financial standpoint, and if forecasts are correct, an investment with positive NPV is worth making since it will create value. Conversely, an investment with negative NPV should be avoided as it will destroy value.

Sometimes investments with negative NPV are made for strategic reasons, such as to protect a position in the industry sector or to open up new markets with strong, yet hard-to-quantify, growth potential. It must be kept in mind that if the NPV is really negative, it will certainly lead to the destruction of value. Sooner or later, projects with negative NPV have to be offset by other investments with positive NPV that create value. Without doing so, the company will be headed for ruin.

> An investment with an NPV of zero will not create value, but it will not destroy value either.

The internal rate of return (IRR) is simply the rate of return on an investment. Given an investment's degree of risk, it is financially worthwhile if the IRR is higher than the required return. On the other hand, if the IRR is lower than the risk-based required rate of return, the investment will serve no financial purpose.

Net present value (NPV) measures the value created by the investment and is the best criterion for selecting or rejecting an investment, whether it is industrial or financial. When it is simply a matter of deciding whether or not to make an investment, NPV and IRR produce the same outcome. However, if the choice is between two mutually exclusive investments, net present value is more reliable than the internal rate of return.

From a conceptual and methodological point of view, NPV is a better criterion as it takes into account risk (payback ratio does not), the whole stream of cash flows (idem) and assumes that intermediate cash flows are reinvested at the cost of capital, which is more realistic than IRR (which implicitly assumes reinvestment at the IRR, which may be above the cost of capital).

Actual computation of NPV is not always well applied. Indeed, some managers discount cash flows using the cost of capital of the group and not at a rate that reflects the market risk of the specific project. **It should be kept in mind that a very risky project will increase the overall risk of the firm and thus should be discounted at a higher rate** (and vice versa). We will highlight this point in the next chapter.

Graham and Harvey (May 2001) conducted a broad survey of corporate and financial managers to determine which tools and criteria they use when making financial decisions. They asked them to indicate how frequently they used several capital budgeting methods. The findings showed that net present value and internal rate of return carry the greatest weight, and justifiably so. Some 75% of financial managers systematically value investments according to these two criteria. This proportion increases over time demonstrating that pedagogy in finance is not useless.

Interestingly, large firms apply these criteria more often than small and medium-sized companies, and MBA graduates use them systematically while older managers tend to rely on the payback ratio.

Conclusions are slightly different for small and medium companies for which (according to a study by Danielson and Scott) intuition comes first (26%), then payback ratio (19%), ROCE (14%) and NPV (12%).

Section 28.2 THE MAIN LINES OF REASONING

All investment decisions must comply with the following six principles:

consider cash flows rather than accounting data;

reason in terms of incremental cash flows, considering only those associated with the project;

reason in terms of opportunity;

disregard the type of financing;

consider taxation; and

above all, be **consistent**.

1/ REASON IN TERMS OF CASH FLOWS

We have already seen that the return on an investment is assessed in terms of the resulting cash flows. Indeed, only cash flows can be invested and earn interest or be used to repay a debt and stop the payment of its interests. One must therefore analyse the negative and positive cash flows, and not the accounting income and expenses. These accounting measures are irrelevant because they do not take into account working capital generated by the investment and include depreciation, which is a non-cash item.

> As a result, only cash flows are relevant in the financial analysis of investments.

We stress the fact that in finance, an amount costs only when it is disbursed and earns only when it is received, regardless of the accounting treatment applied to it.

2/ REASON IN TERMS OF INCREMENTAL FLOWS

When considering an investment, one must take into account the flows it generates, all the flows derived from the investment, and nothing else but these flows. It is crucial to assess all the consequences of an investment

upon a company's cash position. Some of these are self-evident and easy to measure, and others are less so.

A movie theatre group plans to launch a new complex, and substantial costs have already been incurred in its design. Should these be included in the investment's cash flows? The answer is no, since the costs have already been incurred regardless of whether or not the complex is actually built. These are **sunk costs**. Therefore, they should not be considered part of the investment expenditure.

It would be absurd to carry out an investment simply because the preparations were costly and one hopes to recoup funds that, in any case, have already been spent. The only valid reason for pursuing an investment is that it is likely to create value.

Now, if the personnel department has to administer an additional 20 employees hired for the new complex (e.g. 5% of its total workforce), should 5% of the department's costs be allocated to the new project? Again, the answer is no. With or without the new complex, the personnel department is part of overhead costs. As a general rule, structural costs cannot be attributed, even in part, to an investment because they are independent of it. Structural expenses would only be affected if the planned investment generates additional costs – which in our example is recruitment expenses.

However, design and overheads will be priced (to the extent possible given the competitive environment) into the ticket charged for entry to the new complex. Finance here differs quite markedly from management control.

A perfume company is about to launch a new product line that may cut sales of its existing perfumes by half. Should this decline be factored into the calculation of the investment's return? Yes, because the new product line will prompt a shift in consumer behaviour: the decline in cash flow from the older perfume stems directly from the introduction of this new product.

When estimating cash flows on an incremental basis, one only considers the future cash flows arising from the investment. Our objective is to calculate the investment's marginal contribution to the company's cash flows.

Nevertheless, we can mention that in certain very specific sectors with very low marginal costs, this reasoning may lead to overinvestment, creating overcapacity and therefore price wars.

3/ REASON IN TERMS OF OPPORTUNITY

For financial managers, an asset's value is its market value, which is the price at which it can be bought (investment decision) or sold (divestment decision). From this standpoint, its book or historic value is of no interest whatsoever, except for tax purposes (taxes payable on book capital gains, tax credit on capital losses, etc.).

For example, if a project is carried out on company land that was previously unused, the land's after-tax resale value must be considered when valuing the investment. After all, in principle, the company can choose between selling the land and booking the after-tax sales price, or using the land for the new project. Note that the book value of the land does not enter into this line of reasoning.

The opportunity principle boils down to some very simple rules:

if a company decides to hold on to a business, this implies that it should be prepared to buy that business (if it did not already own it) in identical operating circumstances; and

if a company decides to hold on to a financial security that is trading at a given price, this security is identical to one that it should be prepared to buy (if it did not already own it) at the same price.

Financial managers are, in effect, “asset dealers”. They must introduce this approach within their company, even if it means standing up to other managers who view their respective business operations as essential and viable. Only by systematically confronting these two viewpoints can a company balance its decision-making and management processes.

Theoretically, a financial manager does not view any activity as essential, regardless of whether it is one of the company's core businesses or a potential new venture. The CFO must constantly be prepared to question each activity and reason in terms of:

buying and selling assets; and

entering or withdrawing from an economic sector of activity.

> If we push our reasoning to the extreme, we could say that for financial managers an investment is never a necessity, but simply a “good or bad” opportunity.

The concept of necessity should be interpreted as regards the strategy of the firm, the investment is then a tool for achieving this strategy; a necessary tool, hence highly profitable.

4/ DISREGARD THE TYPE OF FINANCING

When comparing an investment's return with its cost of financing, the two items must be considered separately.

In practice, since the discount rate corresponds to the required rate of return necessary to cover the total cost of financing the investment, interest expense, repayments or dividends should not be included in the flows. **Only operating and investment flows are taken into account, but never financing flows. This is the same distinction that was made in Chapter 2.** Failure to do so would skew the project's net present value. This would also overstate its IRR, since the impact of financing would be included twice:

first, within the weighted average cost of capital for this investment, which is its cost of financing; and

second, at the cash flow level.

To demonstrate this, consider, for example, an investment with the following flows:

Year	0	1	2	3
Investment flows	−100	15	15	115

The NPV of this investment is 7.2 (if cash flows are discounted at 12%) and its IRR is 15%. Now, assume that 20% of the investment was financed by debt at an annual after-tax cost of 6%. Then it is possible to deduct the debt flows from the investment flows and calculate its NPV and IRR:

Year	0	1	2	3
Investment flows	−100	15.0	15.0	115.0
Debt financing flows	20	−1.2	−1.2	−21.2
Net flows to equity	−80	13.8	13.8	93.8

With a rate of 12%, the NPV is 10.1 and the IRR is 17.2%. Now, if 50% of the investment were financed by debt, the NPV would rise to 14.4 and the IRR to 24%. At 80% debt financing, NPV works out to 18.7 and the IRR to 51%.

This demonstrates that by taking on various degrees of debt, it is possible to manipulate the NPV and IRR. This is the same as using the financial leverage that was discussed in Chapter 12. However, this is a slippery slope. It can lead unwary companies to invest in projects whose low industrial profitability is offset by high debt, which in fact increases the risk considerably.

> All that matters is the investment's return *per se*.

When debt increases, so does the required return on equity as the risk increases for shareholders, as we have seen in Chapter 12. It would be incorrect to continue valuing the previous NPV at a constant discount rate of 12%. The discount rate has to be raised in conjunction with the level of debt. This corrects our reasoning and NPV remains constant. The IRR is now higher, but the minimum required return has risen as well to reflect the greater degree of risk of an investment financed by borrowings.

It would be absurd to believe that one can undertake an investment because it generates an IRR of 10% whereas the corresponding debt can be financed at a rate of 7%. In fact, the debt is only available because the company has equity that acts as collateral for creditors. Equity has to be remunerated, and this is not reflected in the 7% interest on the debt. No company can be fully financed by debt, and it is therefore impossible to establish a direct comparison between the cost of debt and the project's return.

5/ CONSIDER TAXATION

Clearly, taxation is an issue because corporate executives endeavour to maximise their **after-tax** flows; it goes without saying that this is done while respecting fiscal regulations. Consider that:

additional depreciation generates tax savings that must be factored into the equation;

the cash flows generated by the investment give rise to taxes, which must be included as well; and

certain tax shields offer tax credits, carbon credits, rebates, subsidies, allowances and other advantages for carrying out investment projects.

In practice, it is better to value a project using after-tax cash flows and an after-tax discount rate in order to factor in the various tax benefits from an investment. Therefore, the return required by investors and creditors is calculated after tax.

In cases where cash flows are discounted before tax, it is important to ascertain that all flows and components of weighted average cost of capital are considered before taxes as well.

> When considering an investment, it is also necessary to look at the tax implications.

6/ BE CONSISTENT!

The best advice we can give to our readers is to always be consistent. If the basis of valuation is constant euro values – that is, excluding inflation – be sure that the discount rate excludes inflation as well. We recommend using current euro values, because the discount rate already includes the market's inflation expectations.

If it is a pre-tax valuation, make sure the discount rate reflects the pre-tax required rate of return. We recommend using after-tax valuations because a world without taxes only exists in textbooks!

And if flows are denominated in a given currency, the discount rate must correspond to the interest rate in that currency as well.

7/ AND WHAT ABOUT ENERGY TRANSITION?

Should the urgency of energy transition not lead to the adoption of new investment selection criteria in order to facilitate it? We do not think so. Current criteria can quite easily account for incentives favouring energy transition, be it in terms of flows (subsidies, carbon credits, etc.) or the discount rate, as we will see in Chapter 29.

This being said, a company is not forced to select, from among mutually exclusive investments, the one with the best NPV if it goes with a high carbon footprint. It should be noted that such a situation would reflect an unsatisfactory incentive/regulatory balance put in place by governments. The company may even decide to hold on to an investment with a negative NPV in order to help the planet. But in a competitive market, a firm cannot be virtuous on its own. It will find it difficult to behave in this way unless, on the other hand, it makes investments with a positive NPV to offset its virtuous behaviour.

Section 28.3 WHICH CASH FLOWS ARE RELEVANT?

In practice, three types of cash flow must be considered when assessing an investment: **operating flows, investment flows and extraordinary flows**. Financial managers try to plan both the amount of a cash flow and its timing. In other words, they draw up projections of the cash flows on the investment.

Where the investment has a limited life, it is possible to anticipate its cash flows over the entire period. But, in general, the duration of an investment is not predetermined, and one assumes that at some point in the future it will be either wound up or sold. This means that the financial manager has to forecast all cash flows over a given period with an explicit forecast period, and reason in terms of *residual (or salvage) value* beyond that horizon. The residual value reflects the flows extending beyond the explicit investment horizon, and on into infinity. Although the discounted residual value is frequently very low since it is very far off in time, it should not be neglected. Its book value is sometimes zero, but its economic value may be quite significant since accounting depreciation may differ from economic depreciation. If some of the assets may be sold off, one must also factor in any taxes on capital gains.

1/ OPERATING FLOWS

The investment's contribution to total earnings before interest, taxes, depreciation and amortisation (EBITDA) must be calculated. It represents the difference between the additional income and expenses arising from the investment, excluding depreciation and amortisation.

Then, from EBITDA, the **theoretical** tax on the additional operating profit must be deducted. This tax is then calculated by multiplying the tax rate borne by the project with the differential on the operating profit, taking into account any tax-loss carryforwards which could be used.

It is essential to deduct changes in working capital from EBITDA. Unfortunately, many people tend to forget this. In most cases, working capital is just a matter of a time lag. It builds up gradually, grows with the business and is retrieved when the business is discontinued. A euro

capitalised today in working capital can be retrieved in 10 years' time, but it will not be worth the same. Money invested in working capital is not lost. It is simply capitalised until the investment is discontinued. However, this capitalisation carries a cost, which is reflected in the discounted amount.

2/ INVESTMENT FLOWS

Investment in fixed assets comprises investment in maintenance, production capacity and growth, whether in the form of tangible assets (machinery, land, buildings, etc.) or intangible assets (research and development, patents and licences, business capital, etc.) or financial assets (shares in subsidiaries) for external growth.

The investment must be assessed for each period, as the investment is not necessarily restricted to just one year, nor spread evenly over the period. Once again, remember that our approach is based on cash and not accounting data. The investment flows must be recognised when they are paid, not when the decisions to make them were incurred. And finally, do not forget to reason in terms of net investment; that is, after any disposals, investment subsidies and other tax credits.

3/ EXTRAORDINARY FLOWS

It may seem surprising to mention extraordinary items when projecting estimated cash flows. However, financial managers frequently know in advance that certain expenses that have not been booked under EBITDA (litigation, tax audits, etc.) will be disbursed in the near future. These expenses must all be included on an after-tax basis in the calculation of estimated free cash flow.

Extraordinary flows can usually be anticipated at the beginning of the period since they reflect known items. Beyond a two-year horizon, it is generally assumed that they will be zero.

This gives us the following cash flow table:

Periods	**0**	**1**	**…**	***n***
Incremental EBITDA		+	+	+ +
− Incremental tax on operating profit		−	−	−

Periods	**0**	**1**	**…**	***n***
− Change in incremental working capital	− −	− −	−	+ +
− Investments	− − −	−	−	
+ Divestments after tax	+		+	+ +
− Extraordinary marginal expenses			−	
= Cash flow to be discounted = Free cash flows	− −	+	+	+ +

Section 28.4 OTHER INVESTMENT CRITERIA

1/ THE PAYBACK PERIOD

The payback period is the time necessary to recover the initial outlay on an investment. Where annual free cash flows are identical, the payback period is equal to:

$$\frac{Investment}{Annual\ free\ cash\ flow}$$

For the following investment:

Period	0	1	2	3	4	5
Cash flows	−2.1	0.8	0.8	0.8	0.8	0.8

the payback period is 2.1 / 0.8 = 2.6 years.

Where the annual flows are not identical, the cumulative cash flows are compared with the amount invested, as below:

Period	0	1	2	3	4	5
Cash flows	−1	0.3	0.4	0.4	0.5	0.2
Cumulative cash flows		0.3	0.7	1.1	1.6	1.8

The cumulative flow is 0.7 for period 2 and 1.1 for period 3. The payback period is thus two to three years. A linear interpolation gives us a payback period of 2.75 years.

Once the payback period has been calculated, it is compared with a cut-off date determined by the financial manager. If the payback period is longer than the cut-off period, then the investment should be rejected. Clearly, when the perceived risk on the investment is high, the company will look for a very short payback period in order to get its money back before it is too late!

The payback ratio is used as an indicator of an investment's risk and profitability. However, it can lead to the wrong decision, as shown in the example below of investments A and B.

	Flows in period 0	Flows in period 1	Flows in period 2	Flows in period 3	Recovery within	20% NPV
Investment A	−1,000	500	400	600	2 years and 2 months	42
Investment B	−1,000	500	500	100	2 years	−178

The payback rule would prompt us to choose investment B, even though investment A has positive NPV but B does not. The payback rule can be misleading because it does not take all flows into account.

> The payback rule emphasises the liquidity of an investment rather than its value.

Moreover, because it considers that a euro today is worth the same as a euro tomorrow, the payback rule does not factor in the time value of money. To remedy this, one sometimes calculates a discounted payback period representing the time needed for the project to have positive NPV. Returning to the example, with a 20% discount rate, it then becomes:

Year	0	1	2	3	4	5
Cumulative present values	−2.1	−1.43	−0.88	−0.41	−0.03	0.29

The discounted payback period is now 4 years compared with 2.6 years before discounting. Discounted or not, the payback period is a risk indicator, since the shorter it is, the lower the risk of the investment. **That said, it ignores the most fundamental aspect of risk: the uncertainty of estimating liquidity flows.** Therefore, it is just an approximate indicator since it only measures liquidity.

However, the payback ratio is fully suited to productive investments that affect neither the company's level of activity nor its strategy. Its very simplicity encourages employees to suggest productivity improvements that can be seen to be profitable without having to perform lengthy calculations. It only requires common sense. However, calculating flows in innovative sectors can be something of a shot in the dark.

It should be noted that some companies calculate the NPV of their potential investments over a limited period (5 years for example); cash flows beyond this period are considered too uncertain and are neglected. In such cases, the practice is equivalent to the discounted payback period.

2/ RETURN ON CAPITAL EMPLOYED

The return on capital employed (ROCE) represents the increase in after-tax operating profit generated by the investment over the year divided by the capital employed (sum of fixed assets and the working capital generated by the investment):

$$\text{ROCE} = \frac{\text{Operating income after tax}}{\text{Net average fixed assets} + \text{Net average working capital}}$$

The average accounting return can also be calculated, which is the average of annual ROCEs over the life of the investment. The computation of ROCE takes into account the after-tax operating profit and capital employed (working capital plus the residual investment after depreciation).

By not taking into account when cash flows occur accounting rates of return generally overstate the rates of return (as high returns are more distant in time). Another drawback with accounting rates of return is that they maximise rates without considering the corresponding risk.

On the surface, it may seem that there is no connection between return on capital employed and the internal rate of return. The first discounts flows, while the second calculates book wealth. And yet, taken over a year, their outcomes are identical. An amount of 100 that increases to 110 a year later has an IRR of $100 = 110 / (1 + r)$, so $r = 10\%$, and ROCE of 10 / 100, or 10%.

ROCE and IRR are equal over a given period of time. ROCE is therefore calculated by period, while IRR and NPV are computed for the entire life of the investment.

Although accounting rates of return should not be used as investment or financing criteria, they can be useful financial control tools.

Sooner or later, an IRR has to be translated into an accounting rate of return. If not, the investment has not generated the anticipated ex-post return and has not achieved its purpose. We strongly advise you to question any differences between IRR and ROCE, i.e. do profits arise unevenly over the period (starting out slowly or not at all and then gathering momentum), what is the amount of terminal value, are there calculation errors, is the hypothesis on the return of cash flows ploughed back in the business correct, etc.?

3/ CAPITAL RATIONING AND THE PRESENT VALUE INDEX

Sometimes there is a strict capital constraint imposed on the firm, and it is faced with more NPV-positive projects than it can afford. In order to determine which project(s) to pursue, some use the **present value index (PVI)**. This is the present value of cash inflows divided by the present value of cash outflow:

$$PVI = \frac{\text{Present value of inflows}}{\text{Present value of outflows}}$$

By using the PVI, financial managers can rank the different projects and then select the investment with the highest PVI – that is, the project with the highest NPV relative to the present value of outflows. After making this selection, if the total amount of capital available has not been fully exhausted, the managers should then invest in the project with the second-highest PVI, and so on until no more capital remains to invest as long as PVI remains above 1.

Our reader will have noticed that just like the IRR, the profitability index does not take into account the size of the project, and two projects with the same IP can generate very different NPVs!

SUMMARY

The summary of this chapter can be downloaded from www.vernimmen.com.

The criteria on which investment decisions are based include:

first and foremost, net present value (NPV), which is the best criterion because it measures the value creation of the investment;

the internal rate of return (IRR), which measures the yield to maturity of the investment; and

if necessary and to simplify calculations, the payback ratio, which measures the amount of time needed to pay back the investment, and the return on capital employed (operating profit after tax for the period divided by capital employed for the period), which is more of a financial control tool.

The flows that are used for calculating NPV and IRR are free cash flows:

EBITDA on the investment;

corporate income tax calculated on the operating income of the investment;

change in working capital created by the investment;

capital expenditure (including any possible divestments).

To avoid making errors, it is necessary to:

reason only in terms of cash flow, not charges and revenues;

reason in terms of incremental flows – i.e. consider the cash flows arising on the investment, all the cash flows arising on the investment and only the cash flows arising on the investment. This involves calculating the investment's marginal contribution to the company's cash flows;

reason in terms of opportunity – i.e. in financial values and not in book values;

disregard the way in which the investment was financed – flows used in the calculations never include financial income and expenditure, new loans and repayment of loans, capital increases and capital reductions or dividends;

consider ordinary taxation (on operating profits) or exceptional taxes (on capital gains, subsidies, etc.); and

finally, the best advice is to **be consistent!**

In the business world, the differences between practice and theory in investment decisions are diminishing. Financial managers now look increasingly at NPV and IRR when making investment decisions.

QUESTIONS

1/When making an investment decision, should you reason:

in terms of cash flow;

marginally;

without regard to the type of financing;

with consideration for taxation?

2/Define the payback ratio.

3/What are the drawbacks of the payback ratio?

4/Define return on capital employed.

5/Can an investment decision be based on return on capital employed?

6/What purpose does the return on capital employed serve?

7/What roles do depreciation and amortisation play in the calculation of cash flows to be discounted?

8/What is the optimal depreciation method for a company that is not taxed? What about for a company that pays tax at the standard rate?

9/A company is planning to build a new plant to replace an older one that is to be demolished. Which flows should be considered?

market value of the land and the older plant;

demolition costs;

costs of building an access road the previous year;

production losses while an old plant is demolished and a new one is being built;

depreciation of the plant;

tax credits on the investment;

a proportion of the salary of the managing director, based on time spent;

constitution of working capital?

10/When can investment in working capital be neglected?

11/Provide examples of investments where residual value must under no circumstances be neglected.

12/In an inflationary environment, how should you reason in evaluating an investment?

13/When operating cash flow is negative, should IRR and NPV be calculated including the interest expense on loans used to finance it?

14/Should an investment subsidy be included in investment flows or by reducing the discount rate?

You'll find more questions at www.vernimmen.com.

EXERCISES

1/The following investment project is submitted to you:

project: extension of an industrial plant;

purchase of equipment €20m;

set-up costs €1.5m;

useful life eight years;

residual value 0;

increase in working capital €2.5m.

The project will result in an increase in EBITDA of €3m per year, over the eight years during which the new asset is used. The equipment is depreciated over five years. The corporate income tax rate is 25%.

Draw up the cash flow schedule for the project, on the basis of straight-line depreciation.

Calculate each of the two cases:

net present value at 10%;

the internal rate of return of the project.

2/A company is planning to replace a machine with a new, better-performing one. The figures for the investment are as follows:

Purchase of new machine:

cost €2m;

useful life five years, residual value nil;

linear depreciation over five years;

savings on charges €0.8m per year.

Sale of second-hand machine:

purchase cost €1.5m (machine bought the previous year);

linear depreciation over five years (residual value is nil);

net book value today €1.2m;

potential sale price €1.0m.

If the tax rate on profits and capital gains/losses is 40%, what is the "value" for the company of the new machine the company is planning to buy (this company's required rate of return is 12%)?

Calculate the net present value and the internal rate of return of the planned investment.

3/Take the following project:

Period	**0**	**1**	**2**	**3**	**4**	**5**
Cash flow	−100	110	−30	25	50	100

What problem do you come up against when calculating the payback ratio? What is the NPV of this project at 10%? What is the IRR?

4/The Catalunia region is prepared to pay €2m to a private company to run a bus service three times a day between Lerida and Tarragona, for a period of 10 years. The initial outlay for the project is estimated at €0.8m, but annual operating losses (excluding depreciation) will amount to €0.2m. What is the NPV for this investment? If the private company's required rate of return is 10%, will it take up the contract? And if it is 15%?

5/Industrial Electric plc estimates its needs for a component used in its products at 7,000 units per year for the next 10 years. A subcontractor offers to supply the parts at €5 per unit.

Industrial Electric can make the part in its own workshops for €3 per unit, if it buys a new machine. A new machine would cost €78,000, have a useful life of 10 years and a residual value of nil. The company generally gets a 10% return (after tax) on its capital expenditure. It depreciates machinery on a straight-line basis and tax is levied at a rate of 25%.

Should the company accept the subcontractor's offer?

6/A large oil company has been invited to get involved in a project to build a parking facility in the centre of Frankfurt. The project includes a 450-car public parking lot, a 200-car garage and a petrol station covering 1,000 sq. m. It will take one year to build, and a 30-year concession to run the facility will be granted by the municipality (after construction has been completed). Total capital expenditure will be €8,400,000 and working capital will be nil. The annual income statement for the project after the construction looks like this:

Costs		**Revenues**	
Operating costs	670,000	Parking places	1,680,000
Depreciation and amortisation	280,000	Garage	770,000
Income tax expense	1,000,000	Petrol station	800,000
Net profits	1,300,000		
Total	3,250,000	**Total**	3,250,000

Calculate the average of the accounting returns on the project, the discounted payback ratio, the net present value at 10% and the internal rate of return. Why is the IRR not equal to the average of the annual returns on the project?

7/A year ago, Robin plc invested in a machine to improve the manufacturing of one of its products. It has just discovered that a new machine has come onto the market which would improve performance more than the one it bought. The first machine cost €8,000 a year ago, and is depreciated on a straight-line basis over eight years (the same period as its useful life, after which it will be scrapped). If it were sold now, the company would get around €5,000 (tax credit on the capital loss would be 25%).

The new machine costs €11,000 and would be depreciated for €10,500 on a straight-line basis over its useful life, estimated at seven years. It could be sold at the end of its useful life for €500, which is what its book value would be.

The company is hoping to produce 100,000 units of its product annually for the next seven years. With the equipment currently in use, the company's per unit cost price breaks down as follows: €0.14 per unit in direct labour costs, €0.10 for raw materials and €0.14 in general costs. The new machine will enable the company to cut direct labour costs to €0.12 per unit produced. The cost of raw materials will drop to €0.09 per unit thanks to a reduction in waste. General costs will remain at €0.14 per unit. All other factors will remain unchanged, in particular supplies, energy consumed and maintenance costs. Profits are taxed at 40%.

Draw up the cash flow schedule for the contemplated investment.

Calculate the discounted payback ratio on this investment.

See also Exercise 6, Chapter 48.

ANSWERS

Question

1/; *2/; 3/; 4/; 5/; 6/ see chapter.*

7/*In calculating tax.*

8/*It makes no difference. Depreciation is quicker.*

9/*(a) yes; (b) yes; (c) no; (d) yes; (e) tax point of view; (f) yes; (g) no; (h) yes.*

10/*When it is negligible!*

11/*Investment in real estate.*

12/*In current euro values.*

13/*No, never, negative flows are part of capital expenditure in finance just as the purchase of a fixed asset is.*

14/*In investment flows, because it is deducted from the flows to be invested and not from the risk, which remains the same.*

Exercises

A detailed Excel version of the solutions is available at www.vernimmen.com.

1/

	Year	0	1	2	3	4	5	6	7	8
−	Investment flows	−21.5								
+	ΔEBITDA		3	3	3	3	3	3	3	3
−	ΔWorking capital		2.5							−2.5
−	ΔTaxes		−0.3	−0.3	−0.3	−0.3	−0.3	0.8	0.8	0.8
=	Cash flows	−21.5	0.8	3.3	3.3	3.3	3.3	2.3	2.3	4.8

NPV = −6.8; IRR = 1.4%.

2/

	Year	0	1	2	3	4	5
−	Purchase of new machine	−2					
+	Sale of old machine	1					
+	Tax credit on capital loss	−0.2 × 25%					
+	Cost savings after tax		0.8 × 75%	0.6	0.6	0.6	0.6
+	Tax savings on incremental depreciation and amortisation		0.1 × 25%	0.02	0.02	0.02	0.04 × 25%
=	Cash flows to be discounted	−0.95	0.63	0.63	0.63	0.63	0.7

NPV = 1.35; IRR = 60%.

3/*Difficult to calculate payback period as investment is made in two phases. NPV = 90.23; IRR = 42.64%.*

4/*At 10% no, at 15% yes.*

5/*Yes, because the NPV on the investment is −€1,500.*

6/*60%, seven years and nine months. NPV at 10% = €6.5m. IRR = 18.7%. As the average accounting return is heavily influenced by the rate of the last year, which is very high (464%) because the asset is practically fully depreciated, and because each year's return carries the same weight, even those far into the future.*

7/*Figures for year 0: 5,000 (sale of old machine) – 11,000 (purchase of new machine) + 500 (tax credit at 25% of capital loss on sale of old machine) = −5,500. Years 1 to 7: (100,000 × 0.03 + (8,000 / 8 – 10,500 / 7)) × 75% − (8,000 / 8 – 10,500 / 7) = 2,375. Year 8: 500. Payback ratio: around 2.7 years.*

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Chapter 29
THE COST OF CAPITAL

Mirror, mirror on the wall …

Determining the cost of capital, or weighted average cost of capital (WACC), is not a simple task, but it is one of the fundamentals of finance. The cost of capital has to be factored into investment decisions because it is the rate that is used for discounting cash flows for NPV or comparing with the IRR. Cost of capital is also used to determine enterprise value (see Chapter 31). Truly, its importance can hardly be understated.

But before reading on, it is imperative to understand the distinction between cost of capital, which is the weighted average cost of the capital contributed to the firm by its shareholders and its lenders, and cost of equity, which is just one component of the weighted average of the cost of capital. The reader should also take care not to rely excessively on spreadsheets without any prior reflection.

Section 29.1 THE COST OF CAPITAL AND THE RISK OF ASSETS

> The cost of capital is the minimum rate of return on the company's investments that can satisfy both shareholders (the cost of equity) and debtholders (the cost of debt). The cost of capital is thus the company's total cost of financing.

When markets are in equilibrium, any investor with a perfectly diversified portfolio holds a fraction of both the company's equity and its debt. This is known as the CAPM, as was discussed in Chapter 19. In other words, each investor holds a share of the company's operating assets, since this is equal to the sum of equity and net debt. Accordingly, each investor has some exposure to the risk arising from the company.

The rate of return required by investors thus depends on just one factor: **the risk arising from the assets-in-place**. This means that the cost of the company's financial resources – its cost of capital – is none other than the rate of return required by investors, which is a function of the risk on capital employed.

> The cost of capital depends solely on the risk of the assets-in-place, specifically its systematic risk, since unsystematic or specific risks are not remunerated.

The cost of capital is thus shaped by the economic characteristics of each sector of activity:

The sensitivity to the economic environment: certain sectors structurally leverage changes in the economic climate. This is the case for transportation or civil works (high economic risk and hence cost of capital). Other sectors are less sensitive to downturns; this is the case for the agri-food industry.

The cost structure (fixed vs. variable costs): the higher the fixed costs (in the cement or steel industries, for example), the more sensitive the firm is to the economic environment and the higher its cost of capital.

The predictability of the activity: between a shopping mall operator benefiting from long-term rents and a fighter aircraft manufacturer, there is quite some difference in terms of predictability of revenues and cash flows. Their cost of capital will differ significantly: low for the shopping mall operator, high for the fighter aircraft manufacturer.

The results growth rates: the higher the growth of future results, the higher the cost of capital. In such cases, the bulk of the enterprise value is due to cash flows which are distant in time and therefore quite sensitive to market fluctuations.

Modigliani and Miller (1958) and Miller (1977)[1] were the first to state that the company's cost of capital is not a function of its capital structure.

If the risk on capital employed is such that it requires a 12% rate of return, and if it is fully equity-financed, then shareholders will expect a minimum 12% return. On the other hand, if it is fully debt-financed, creditors will again require a 12% rate of return since they incur the same risk with the operating assets as the shareholders in the previous example. Lastly, suppose financing is *equally* divided between debt and equity. If the cost of debt is 6%, then shareholders will require an 18% return on equity to achieve a weighted average of 12%, i.e. the remuneration justified by the 12% risk for capital employed or the cost of capital.

Assume that, in a perfect market, the company changes its capital structure – for example, by buying back some of its equity via the issue of new debt. In this case, an investor with a perfectly diversified portfolio who holds 1% of the company's equity and 1% of its debt and thus 1% of its capital employed will continue to hold 1% of capital employed, though now with a lower amount of equity because of the share buy-back and a higher percentage of net debt. The transaction is thus totally neutral for the investor. It will not affect the cost of capital, even if it is now divided between the cost of debt and the cost of equity, because the risk on capital employed remains unchanged.

As we have already discussed, the cost of capital is equal to the weighted average costs of net debt and of net equity. This will be examined in greater detail in the next section.

But our reader should understand that the cost of capital is not a weighted average of two independent costs. It **pre-exists** these costs. The cost of capital determines the cost of equity and the cost of debt on a weighted basis, not the other way around.

It is fundamental to understand this. We shall see that it is only for practical purposes that the cost of capital is reconstituted from the respective costs of net debt and equity.

Section 29.2 COMPUTING THE COST OF CAPITAL

The cost of capital can be calculated in three ways: directly, indirectly or via enterprise value.

1/ DIRECT CALCULATION VIA THE β OF ASSETS

Since a company's liabilities merely provide a “screen” between the asset side of the company and the financial market, the rate of return required to satisfy investors is equal to the risk-free rate plus a risk premium related to the company's activity.

Applying the CAPM gives us:

$$k = r_F + \beta_A \times (r_M - r_F)$$

where k is the weighted average cost of capital, r_F the risk-free rate, r_M the market rate of return and β_A the **beta of assets** or **unlevered beta**; that is, the β of a debt-free company.

Just as the beta of a share measures the deviation between its returns and those of the equity market, so too does the beta of an asset measure the deviation between its future cash flows and those of the market. Yet these two betas are not independent. A firm that invests in projects with a high β_A – in other words, projects that are risky – will have a high β_E on its shares because its profitability will fluctuate widely.

On average, asset betas are below 1 as it is equity betas that are on average, by construction, equal to 1. Excluding the burden of net debt (which is on average positive for firms), asset betas are lower than equity betas.

	Asset beta		Asset beta
Food retail	0.21	Mining	0.87
Food	0.43	Chemicals	0.93
Water utilities	0.45	Gaming	0.93
Telecom	0.48	Automotive	0.94

	Asset beta		Asset beta
Cinema	0.61	Restaurants	0.95
Spirits	0.65	Advertising	0.95
Pharmaceuticals	0.73	Airlines	0.97
Real estate	0.77	Construction materials	0.98
Shipping	0.77	Defense	0.99
Steel	0.81	E-commerce	1.04
Banks	0.81	Automotive equipment	1.17
All sectors[2]	**0.83**	Semiconductors	1.30
Oil & gas	0.83	Construction	1.49

Source: Data from BNP Paribas, Corporate Finance, team BVT, 2021

The β_A can easily be computed, knowing that it is equal to the weighted average of the β of equity and the β of debt, with the weighting being a function of the relative importance of shareholders' equity and net debt by value (V) in the company's financial structure:

$$\beta_{\text{Asset}} = \beta_{\text{Equity}} \times \frac{V_E}{V_E + V_D} + \beta_{\text{Debt}} \times \frac{V_D}{V_E + V_D}$$

β_A can also be expressed as follows:

$$\beta_{\text{Asset}} = \frac{\beta_{\text{Equity}} + \beta_{\text{Debt}} \times \frac{V_D}{V_E}}{1 + \frac{V_D}{V_E}}$$

β_{Debt} corresponds to the beta of the net debt and it should be computed exactly the same way as the beta of equity, which is by regressing the returns on listed debt against market returns. However, it is reasonable to assume that β_{Debt} is equal to zero for weakly leveraged companies. Thus, the previous equation can be simplified as follows:

$$\beta_{\text{Asset}} = \frac{\beta_{\text{Equity}}}{1 + \frac{V_D}{V_E}}$$

We believe that it is not reasonable to simplify the analysis by assuming that $\beta_{\text{Debt}} = 0$ if the leverage of a company is not negligible. In fact, the higher the leverage, the less the financial debt depends on the level of interest rates and the more will be linked to the specific characteristics of the company (fixed costs/variable costs) and its industry (cyclicality). In these cases, debt then begins to behave more like equity in terms of beta characteristics.

Often, our readers will read that financial analysts prefer using the following formula:

$$\beta_{\text{Asset}} = \frac{\beta_{\text{Equity}}}{\left[1 + (1 - T_C) \times \frac{V_D}{V_E}\right]}$$

This formula differs from the one above, not only as β_{Debt} is assumed to be nil but also because corporate income tax rate (T_C) is introduced. The link between β_{Asset} and β_{Equity} is still subject to debate and depends on the assumptions made regarding the change in capital structure.

This way of computing β_{Asset} is based on the work of F. Modigliani and M. Miller in 1963 (see Section 33.1), according to which the value of the firm is equal to its unlevered value plus the value of the tax shield of debt, computed as the product of the net debt multiplied by the corporate tax rate.

However, this assumes that the firm's indebtedness is constant in perpetuity (which is rarely the case), that the tax rate is constant over time (which has been systematically untrue for decades), that financial interests are fully tax deductible (which is not the case when they become high) and that the cost of bankruptcy is negligible. Actually, for firms with some debts, cost of bankruptcy is of the same order of magnitude as the value of the tax saving due to the debt (Section 33.1).That is a lot for us to embrace!

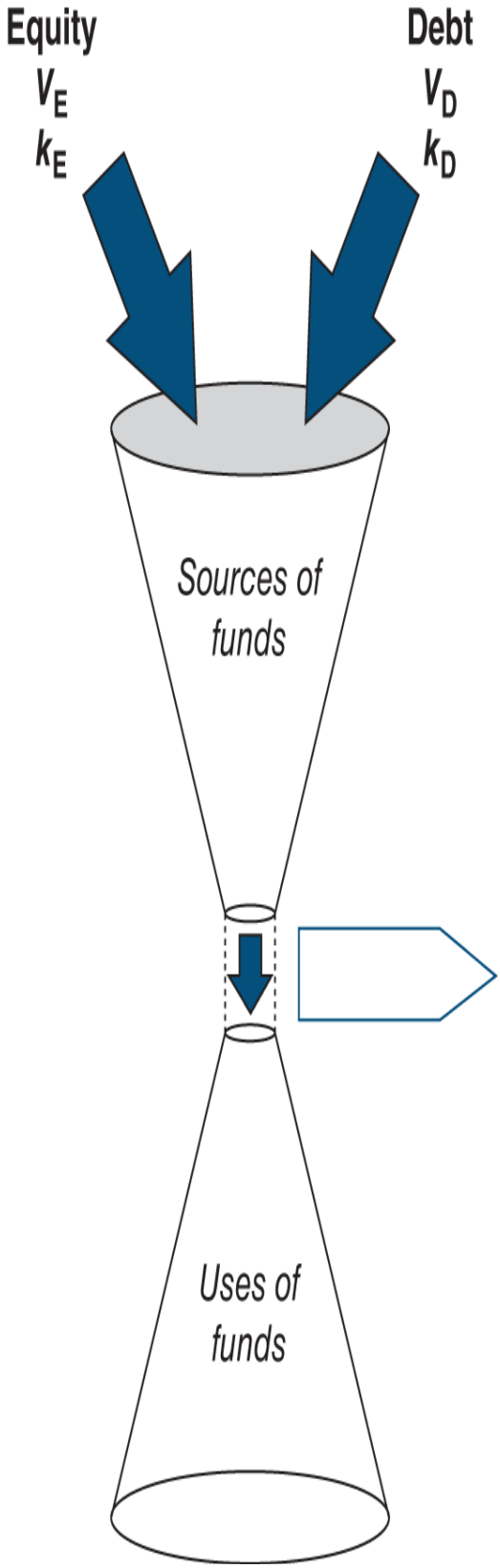
2/ INDIRECT CALCULATION

Since we are looking for the return globally required by all the company's providers of funds, it is possible to **reconstruct the cost of capital based on the valuation of the various financial securities issued by the company.**

Linked to the value of all its securities, the cost of capital represents the cost that the company would have to pay today to raise capital so as to replenish all its financial resources, regardless of the accounting costs of the resources its currently uses. It thus represents the introduction of the logic of the financial market within the company.

Consequently, it is possible to reconstitute the cost of capital of a company by seeking which rate of return is required for each type of financial security and by weighting each rate by its relative share in value in the financing of the company. The result is the weighted average cost of capital formula:

The weighted average cost of capital



Weighted average cost of capital (k):

$$k = k_E \times \frac{V_E}{V_E + V_D} + k_D \times (1 - T_c) \times \frac{V_D}{V_E + V_D}$$

Thus, a company with equity financing of 100 at a rate of 8%, and debt financing of 50 at a pre-tax cost of 3%, has a cost of capital of 6.1% (with a 25% tax rate, T_c).

This is the most frequently used method to calculate the cost of capital. Nevertheless, beware of relying too much on spreadsheets to calculate the cost of capital, instead of getting your hands dirty by working on some examples yourself.

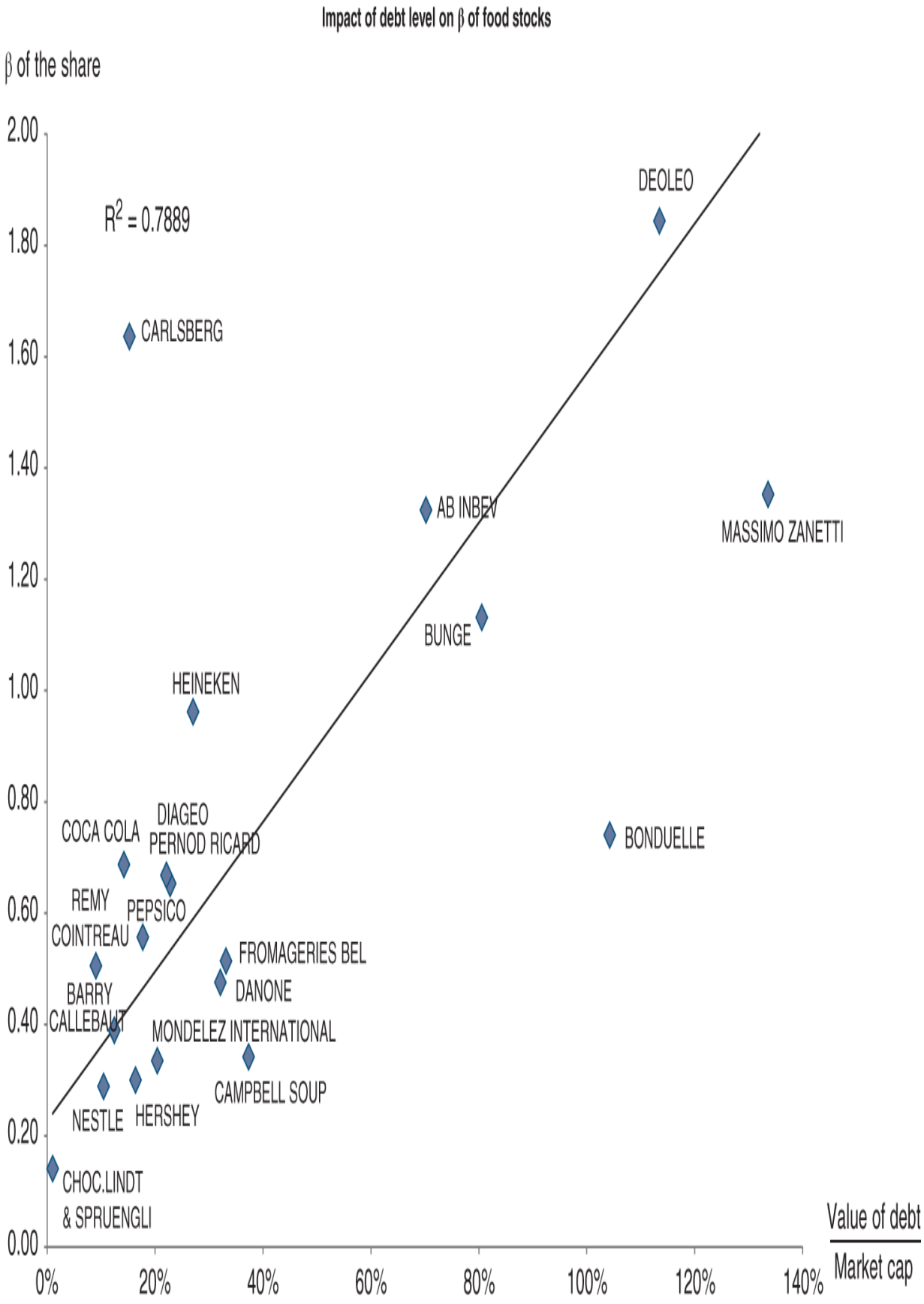
When performing simulations, it is all too tempting to change the company's capital structure while forgetting that the cost of equity and the cost of debt are not constant: they are a function of the company's structure. It is all too easy to fictitiously reduce the cost of capital on paper by increasing the relative share of net debt, because debt is always cheaper than equity!

In the preceding example, if the share of debt is increased to 80% without changing either the cost of debt or equity, then the cost of capital works out to be 3.4%. **While the arithmetic may be correct, this is totally wrong financially**.

Do not forget that higher debt translates into:

a higher cost of equity, as β_{Equity} increases with the debt level, as shown in the graph for food companies,

a higher cost of debt, as the cost of debt increase with the debt level (Section 20.2).


Impact of debt level on β of food stocks
β of the share
2.00
1.80
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
R2 = 0.7889
DEOLEO
CARLSBERG
AB INBEV
MASSIMO ZANETTI
BUNGE
HEINEKEN
BONDUELLE
DIAGEO
COCA COLA
PERNOD RICARD
REMY
COINTREAU
PEPSICO
FROMAGERIES BEL
DANONE
BARRY
CALLEBAUT
MONDELEZ INTERNATIONAL
CAMPBELL SOUP
NESTLE
HERSHEY
CHOC.LINDT
& SPRUENGLI
0%
20%
40%
60%
80%
100%
120%
140%
Value of debt
Market cap

Source: Data from Barra, Factset, annual reports

3/ THE IMPLICIT CALCULATION BASED ON ENTERPRISE VALUE

The cost of capital can be estimated based on enterprise value and a projection of anticipated future free cash flows, since:

$$V = V_E + V_D = \sum_{t=0}^{\infty} \frac{FCF_t}{(1+k)^t}$$

It is then necessary to solve the equation with k as the unknown factor. However, this calculation is rarely used because it is difficult to determine the market consensus for free cash flows over a long period of time.

4/ THE PITFALLS OF THE INDIRECT COST-OF-CAPITAL CALCULATION

(a) Expected rate of return or effective rate of return?

The cost of capital is a financial concept reflecting the *expected* rate of return **required or expected** by investors at a given point in time. It is not an accounting concept and should not be confused with the *ex-post* return on capital employed, which is the **effective** rate of return.

We won't teach our readers that there is often a big difference between what we wish for and what we get.[3]

> Since it is not an accounting concept, the calculation of the cost of capital should be based on market rather than accounting data.

The cost of capital is neither an inverted P/E, nor the return on equity (ROE), nor the rate of return. Instead, it is the rate of return currently required by shareholders as measured by the CAPM:

$$k_E = r_F + \beta_E \times (r_M - r_F)$$

The cost of debt is not the cost of debt contracted 10 years, one year or three months ago. Nor is it the company's average cost of debt or the ratio of financial expenses to average debt for the year, as studied in Chapter 12, which covered the nominal cost of debt.

> The cost of net debt is the rate at which the company could refinance its existing debt given its present economic position. It cannot be lower than the risk-free rate.

(b) Accounting or market values of equity and debt?

Shareholders base their required rate of return on the market value of equity; that is, the amount at which equity can be bought or sold, rather than using book values. The same reasoning applies to debtholders.

> The choice of weighting is based on market values rather than book values.

This is consistent with the idea of selecting the required rate of return rather than the book rate of return. Using the book value of equity and liabilities can be very misleading, because it may significantly differ from the market value of equity and debt.

For example, the Nestlé shareholder does not require a 27%[4] return on book equity of CHF 46bn, but a 5% return on market capitalisation of CHF 310bn! Similarly, an investor buying Legrand USD-denominated bonds with a nominal yield of 8.5% at a price of 127% of the nominal amount does not require an 8.5% return. Instead, they are looking for 1.08%.[5]

Section 29.3 SOME PRACTICAL APPLICATIONS

1/ FOR THE INVESTMENT DECISION

When making an investment decision, and even if using the indirect method, it is not particularly difficult to calculate the cost of capital. If the company is publicly listed, the calculation is based on readily available market data. Average prices are often used to smooth out any erratic market swings. If the company is not listed, the calculation is based on the cost of capital of companies of comparable size and risk operating in the same sector of activity and geographic region. If the peer sample has been well chosen, the resulting cost of capital will be the same as that of the unlisted company.

The trick is elsewhere; one should not mix up the cost of capital of the firm and the cost of capital of the project. The two are the same only if the risk level of the project is the same as that of the firm.

If the company is engaging in a greenfield project (e.g. a new oil field for an oil company), it should add to its cost of capital a premium[6] of c. 2%.

The level or risk of a project can also evolve in time. Usually, the average WACC over the duration of the project will be retained. But it may be more accurate to use a different WACC for each period depending on the maturity and therefore the risk of the investment.

If the company invests in a new sector or a new geography, it will not be able to use its current cost of capital to assess the project. The risk of the project will have to be taken into account to determine the cost of capital to be used. The cost of capital will therefore reflect the industry and geographic risk of the project.

The cost of the funds that will be used to finance the project should never be treated as the cost of capital.

If the financing is by debt, the rate of return to be demanded is certainly higher than the cost of the debt, since the equity, which is used to guarantee the lenders, and without which lenders would not lend, must be remunerated.

Alternatively, if the project is financed by new equity, the cost of capital to be used is likely to be lower than the cost of equity as the higher overall equity will reduce the risk borne by debt holders, and hence their remuneration.

> The company has a pool of resources whose costs are interdependent and with which it finances a pool of assets. Any direct link between the cost of a source of financing and the return to be required from an investment financed in this way is to be banned.

Retaining the cost of the financing source directly instead of the cost of capital will lead to erroneous investment choices, as illustrated by the following example.

Let's take a first investment with an IRR of 8% to be financed with equity that yields a cost of 10%. As the return of the investment does not cover its cost of financing, it is rejected.

A second investment with a similar risk has an IRR of 6%, this time to be financed with debt costing 4%. This investment will then be undertaken as its return is above the cost of financing.

As a result, this reasoning has led the company to undertake the investment yielding the lower return (6% vs. 8%) for the same level of risk. This clearly shows that the reasoning is flawed!

2/ CONCERNING ENERGY AND SOCIAL TRANSITION INVESTMENTS

Contrary to what we have just written in the previous paragraph, we believe that when a company is capable of raising funds via green, social or sustainable bonds or bank facilities whose cost depends on certain environmental or social criteria (see Section 20.4 and Section 21.2), the cost savings that investors may grant should be fully reflected in the cost of capital of the project. Helping the planet is well worth a departure from dogma!

This being said, even when savings do occur, they are relatively marginal in nature.

3/ FOR VALUATION

The indirect method is less adapted to valuations, because to determine the value of equity one needs the cost of capital (see Chapter 31), and to calculate the cost of capital one needs the value of equity! However, there are three ways to solve this dilemma:

use the parameters associated with a target capital structure, that the firm should reach in a few years. While being careful to use the costs of equity and net debt that correspond to the target capital structure, and not the present costs. This is unfortunately a frequently committed error;

state the equation of the value of equity (knowing that you need the value of equity to derive the discount rate) and find, by successive approximation, the discount rate that fits. Excel does iterative calculations that will solve this issue;

use the direct method: the advantage of this alternative is that one avoids the frequent mistake of using costs of equity and debt that do not correspond to the capital structure in question.

4/ DIVERSIFIED COMPANIES

> The overall cost of capital of a diversified company can be calculated similarly to a company with a single business. Conversely, the analyst should be cautious if the divisions do not show the same risk profile as the group. In these cases, each division should be analysed separately as each division has its own cost of capital.

Thus Berkshire Hathaway's cost of capital in itself makes little sense, it is only an a posteriori average of the cost of capital of an insurance group (Geico), a railway company (BNSF), a food company (Kraft Heinz), a portfolio of minority stakes in listed groups (Apple, Bank of America, etc.), etc.

As shown in Chapter 26, diversification does not reduce the cost of capital because it only considers systematic risk. As unsystematic risk can be eliminated by diversification; it does not affect the required rate of return and therefore has no impact on cost of capital.

5/ MULTINATIONAL COMPANIES

A similar logic applies to companies operating in different countries.

A British company investing in Russia, for example, should not use a discount rate based on British data just because its suppliers of funds are British.

After all, the project's flows are affected by the Russian systematic risks (inflation, taxation, exchange rates, etc.) rather than the British systematic risk. It is therefore necessary to take a Russian risk-free rate, to select the β_{Asset} to which a Russian risk premium is applied, to take into account the cost of Russian debt and in no case the UK parameters. This approach avoids the frequent error of discounting flows denominated in a given currency using a discount rate expressed in another currency.

A British, German or Chinese company wanting to invest in the exact same asset in Russia will bear the same cost of capital as it only depends on the risks of the project and not on the risks of the company investing.

After the Western-based company has invested in Russia, its cost of capital will probably be higher as it will be made up of two costs, a lower one for Western Europe and a higher one for Russia, reflecting the different levels of systemic risk (political and macroeconomic) in the two regions.

6/ EMERGING MARKETS

In developing countries, calculating the cost of capital of an investment raises some practical problems. The risk-free rate of local government bonds is often just wishful thinking, since these countries have little solvency. The local risk-free rate and betas of local peer groups are rarely measured, let alone significant, given the limited size of financial markets in these countries.

We suggest Bancel and Perrotin's (1999) system for calculating the cost of capital in such cases:

	Government bond rate of the eurozone
+	Sovereign spread
+	β_A × European risk premium
=	Cost of capital in an emerging market

The sovereign *spread* represents the difference between bond yields issued on international markets (in euros or dollars) by the country in question versus those offered by euro- or dollar-zone bonds. This yield represents the political risk in the emerging country. When the developing nation has not made any international issues, it is possible to use a bond issue by another state with the same credit rating as a benchmark.

When the sovereign spread reflects the fact that the state cannot be considered a risk-free borrower (like Venezuela), we advise using the spread of the best-rated borrower.

β_A is the beta coefficient of the sector of activity calculated in developed financial markets. This parameter measures the sensitivity of an industry's flows to the overall economic environment. It is shaped by the sector of activity, not the country.

Obviously, this rate must be applied to flows that have been converted from their local currencies into euros. If the flows are denominated in dollars, then remember to apply a USD rather than a euro benchmark.

For example, it is possible to calculate the cost of capital of a South African investment project based on the following assumptions: $\beta_A = 0.82$, r_F in the US = 3.0%, a South African government bond rate of 5.3% (bonds denominated in USD), a US risk premium of 6%.

	3.0%
+	5.3% − 3.0%
+	0.82 × 6%
=	10.2% on flows denominated in dollars

If the project's flows are denominated in South African rands, then the cost of capital is converted from dollars into rands as follows:

$$\text{Cost of capital in rands} = \frac{1 + \text{Cost of capital in dollars}}{\dfrac{1 + \text{Inflation rate in dollars}}{1 + \text{Inflation rate in rands}}} - 1$$

This assumes that the rand devaluates against the dollar regularly, in line with the inflation rate differential (purchase power parity).

7/ COMPANIES WITH NEGATIVE NET FINANCIAL DEBT

Consider a group that, for structural reasons, has a negative net debt of 2 with no banking or financial debt, and equity of 9.

Assume that the shareholders buying these shares understand that they are buying both operating assets with a given risk level and have a cash situation with virtually no risk. In other words, the risk on the share is lower than the risk on the company given the structurally positive net cash balance.

The cost of capital of this company can be estimated using the indirect method, applying a **negative value** for V_D. So, in this example, if the cost of equity is 7% and net cash generates 2% after taxes, then the company's cost of capital is 8.4%:

$$k = 7\% \times \frac{9}{9-2} + 2\% \times \frac{-2}{9-2} = 8.4\%$$

To offer the 7% return required by shareholders, the company must invest in projects yielding at least 8.4%. The 7% cost of equity is the weighted average of the required 8.4% return on capital employed and the 2% on net cash.

> The cost of capital for a company with a structurally positive cash balance does not differ from that of a company with the same capital employed but no cash. The cost of equity changes, but the cost of capital remains the same.

Practitioners often use a cost of capital equal to the cost of equity when the firm holds net cash. This is a mistake, unless you consider that shareholders do not take into account the security brought by the net cash.

8/ COMPANIES IN FINANCIAL DISTRESS

It is generally assumed that companies under financial distress have a very high cost of capital. This is not correct! Bankruptcy risk is a specific risk and not a systematic risk, and it should therefore not be taken into account by the cost of capital. If things were not so, the firm in financial distress could never undertake an investment as it would require a higher return than other firms in the sector. It could then never recover.

> The cost of capital for a company in financial distress is identical to that for a company in the same sector that has no difficulties.

On the other hand, its cost of equity can be very high (β_{Equity} between 3 and 10 can be observed), as the value of equity has become negligible compared to the value of debt. But as equity weighs very little in the capital structure, the influence of cost of equity on cost of capital is minimal.

Section 29.4 CAN CORPORATE MANAGERS INFLUENCE THE COST OF CAPITAL?

Chapters 32 and 33 demonstrate why there is little point in using debt and its tax advantages to lower the cost of capital. While net debt costs less than equity, it tends to increase the risk to shareholders, who retaliate by raising the required rate of return and consequently the cost of equity. Debt works to the advantage of the company, because the interest on the net debt can be deducted from its tax base (which it cannot do for dividends). The opposite tends to apply to investors.

In short, in a perfect world in which investors had diversified portfolios, one man's gain would be another man's loss.

Moreover, if debt really did reduce the cost of capital, one would have to wonder why highly efficient companies – such as L'Oréal, Heineken, Toyota, Google and SAP – are not levered, given that they have no reason to fear bankruptcy.

Since the cost of capital depends on the risk to the company, the only way it can be lowered is through risk-reducing measures, such as:

Lowering the breakeven point by shifting from fixed to variable costs, i.e. subcontracting, outsourcing, etc. Unfortunately, the margins will probably decline accordingly.

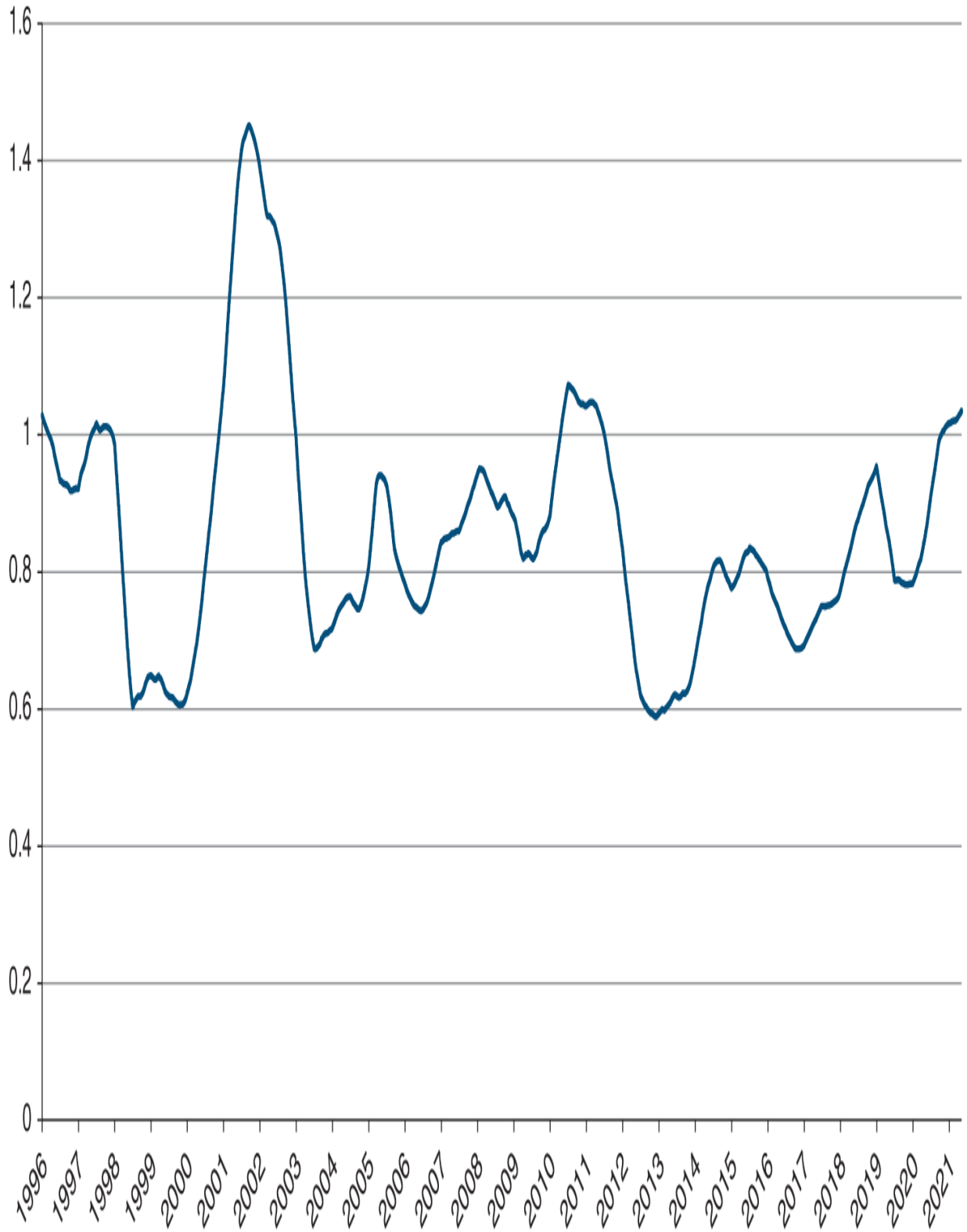
Improving the business's visibility and smoothing its cyclical nature, i.e. winning medium-term supply contracts with important clients. Here too, however, margins may be affected since, in exchange, the clients will demand price concessions.

Diversifying the business does not help as it does not reduce market risk, but rather specific risk, which is the only one to be remunerated.

Shifting from a risky activity (e.g. a biotech start-up) in a high-risk country like Pakistan to a safer business in a more stable country (cheese production in Switzerland) will no doubt cut the cost of capital, but it will also lower profitability. In addition, it would have no impact on value, since it is simply a move on the security market line.

Similarly, increasing the risk for capital employed increases the cost of capital, but value will not be destroyed if profitability improves at the same time.

The cost of capital of Bouygues increased as it launched media and telecom activities (riskier than its traditional construction operations) and then decreased as these operations matured.


Impact of business profile evolution of Bouygues on its β
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021

Source: Data from Factset, moving average over 6 months

In conclusion, managers have virtually no means of lowering the cost of capital while simultaneously creating value. Their main leverage in this area is the quality of the information given to the market, which several studies have shown can lower the cost of capital.[7] This does not mean that CFOs should not spot and try to benefit from market inefficiencies that may appear from time to time by selling the firm's securities at the highest price possible. Hence, they may have negotiated syndicated loans in 2014–19 because banks accepted very thin spreads; issued convertible bonds in 2016 on very attractive terms; or listed renewable energy subsidiaries at the top of the bubble at end 2020–beginning 2021. They also participate in the general equilibrium and can marginally reduce the cost of capital of the firm with an unchanged level of risk.

SUMMARY

The summary of this chapter can be downloaded from www.vernimmen.com.

The cost of capital or the weighted average cost of capital (WACC) is a fundamental concept in corporate finance. It is relied on for making investment decisions and for the valuation of businesses.

The cost of capital only depends upon the market risk of operating assets. It exists before the capital structure is even fully assembled or finalised. In fact, lenders and shareholders will determine the rate of return they require on debt and equity on the basis of the capital structure and of the risk of operating assets.

Only for calculation purposes is the cost of capital often calculated as the weighted average cost of equity and debt.

The cost of capital can be calculated by:

using a direct method on the basis of the β of operating assets; or

using an indirect method where it is equal to the weighted average of the cost of equity and the cost of net debt; or

observing the value of operating assets, when this figure is available.

The cost of capital of a firm is a global notion. It should be used in the choice of investment only for projects that bear a risk similar to that of the operating assets of the firm. If this is not the case, then a specific cost of capital should be computed, keeping in mind that it should be disconnected from the sources of financing.

For a diversified company, there are as many costs of capital as there are sectors in which it operates. Similarly, every country or economic area has its own specific cost of capital, which is dependent upon the political landscape and macroeconomic risks.

For emerging countries, the methodology must be adapted to factor in both the lack of certain data (risk-free interest rate) and the use of international parameters (the industry's β).

A company's negative net debt structure brings down the cost of its equity, but has no impact on the cost of capital, which is the same as if

the company had no cash.

Managers have very little margin for manoeuvre to create value by reducing their cost of capital, because if they lower the cost of capital they will most likely also lower expected returns. The only way they can do is by providing better information to the market.

QUESTIONS

1/When is the cost of capital equal to the cost of equity? Can the cost of capital be equal to the cost of debt?

2/Why does the cost of capital constitute a direct link between return on capital employed and the returns required by investors?

3/Why is the cost of capital not an accounting concept?

4/What is the cost of capital equal to?

5/Is the cost of equity equal to the dividend yield?

6/How many costs of capital are there in a company that has diversified into different (business) sectors but not geographic areas? What about if it has done so within each of the company's divisions?

7/Can a company that invests in projects on which the returns are lower than its cost of capital continue to obtain resources through cash flow? Through debt? Through capital increases?

8/A listed company launches a takeover bid on another company at a price that is far too high. According to the cost of capital theory, what should the sanction be?

9/Can diversification reduce the cost of capital?

10/Does a firm have a low cost of capital because it is leveraged or did it become leveraged because it has a low cost of capital?

You'll find more questions at www.vernimmen.com.

EXERCISES

1/What is the cost of equity of a company whose shares are trading at 30.2 and which pays a dividend of 5 over five years and 6 after five years?

2/What is the cost of debt for a company whose debt at 11% has a nominal value of 1,000, is trading at 1,037.9 and has a life of five years (redemption at maturity)?

3/Use the answers to questions 1 and 2 and calculate the cost of capital of this company. The company has issued 1,000 shares, the corporate tax rate is 34%.

4/Calculate the cost of capital of a company for which the key figures are as follows:

	Equity	**Debt**
Book value	10,000	1,000
Value	12,000	1,000
Perpetual remuneration	1,800	100

5/What is the net present value of the following perpetual investment before and after tax?

Cost:	100
Cash flow before tax:	26
Tax rate:	25%

Capital structure:

	Percentage (%)	**Cost before tax (%)**	**Cost after tax (%)**
Equity	60	12	12
Debt	40	4	3

6/Cyclone case study

The Cyclone group operates in three sectors: the sale of commercial shipping equipment, shipping of goods by sea between mainland India and Sri Lanka (the group owns two container ships) and a small shipyard which oversees the careenage of most of the boats in Sri Lanka.

The three divisions are listed on the Mumbai Stock Exchange.

	Equipment sales division	**Maritime shipping division**	**Shipyard**
Market capitalisation	2,160	18,520	632
Shareholders' equity	1,580	10,5120	8240
Net debt (estimated value)	812	212	−1,356
Sales	22,210	23,724	701
EBIT	405	1,625	82
Net income	226	1,057	−24
β_E observed	0.8	0.5	1.2
β_D estimated	0.1	0	0.3
Tax rate	35%	35%	35%

What is your view of the financial health of this group (very simple financial analysis)?

The required return for a risk-free investment is around 6.5% (before tax) and the average required return for the market portfolio is 11% (before tax). Calculate the overall cost of capital for this group.

ANSWERS

Question

1/*When debt is zero. Yes, but only if the company is carrying very heavy debts.*

2/*By definition.*

3/*Because it is the cost at which the company could reconstitute its liabilities and equity today.*

4/*To the required return on the capital employed.*

5/*No, it is generally much higher.*

6/*As many as there are divisions. Only one.*

7/*Yes, unfortunately using cash flow. Yes, using debt if its debts are still low. With difficulty through a capital increase.*

8/*Its value drops.*

9/*No, as only the market risk is remunerated.*

10/*It has a low cost of equity because its assets are not risky, it can therefore be financed largely by debt.*

Exercises

A detailed Excel version of the solutions is available at www.vernimmen.com.

1/18.00%.

2/10.00%.

3/17.62%.

4/14.62%.

5/Before tax: k = 8.8%; NPV = 195. After tax: k = 8.4%; NPV = 132.

6/Cyclone case study

The group is economically cohesive (it is not a conglomerate). The shipping and equipment sales divisions are profitable, although the shipyard is not; however, it is a small division compared with the others. Overall, the group is profitable and carries very little debt. There is the possibility that the current capital allocation may not be optimal, given the co-existence of profitable divisions and a non-profitable division.

	Equipment sales division (%)	**Maritime shipping division (%)**	**Shipyard (%)**	**Group (%)**
k_E	10.10	8.75	11.90	8.98
k_D after tax	4.52	4.23	5.10	4.89
K	8.57	8.75	7.26	8.60

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The following websites provide information on the cost of capital:

Europe: www.associes-finance.fr.

US: www.ibbotson.com, www.damodaran.com.

NOTES

1 *See Chapters 32 and 33.*

2 *This figure is lower than 1 since it is not the β of all shares on the market that average 1, but the β excluding the impact of net debt.*

3 *If necessary, we direct our readers to the Rolling Stones' "You can't always get what you want".*

4 *Book return on 2020 equity.*

5 *Yield to maturity of the bond listed at 127% and maturing 2025.*

6 *Called greenfield premium.*

7 *See Easley and O'Hara (2004).*

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Chapter 30
RISK AND INVESTMENT ANALYSIS

When uncertainty creates value …

Valuing an investment by discounting future free cash flows at the weighted average cost of capital can provide some useful parameters for making investment decisions, but it does not adequately reflect the investors' exposure to risk. On its own, this technique does not take into account the many factors of uncertainty arising from non-financial investments.

As a result, many risk analysis methods have been developed. However, these methods have limitations that only a radically different approach seeks to overcome. We will see that the application of option theory to investment choice theoretically offers this possibility. Although it brings decisive concepts to risk analysis in investment, it is far from being frequently applied, often for good reasons.

Section 30.1 ASSESSING RISK THROUGH THE BUSINESS PLAN

1/ BUILDING A BUSINESS PLAN

The reader must realise that the business plan is the first stage in assessing the risks related to an investment. The purpose of the business plan is to model the firm's most probable future, and it helps to identify the parameters that could significantly impact on a project's value. For example, in certain industries where sales prices are not very important, the model will be based on gross margins, which are more stable than turnover.

Establishing a business plan helps to determine the project's dependence upon factors over which investors have some influence, such as costs and/or sales price. It also outlines those factors that are beyond entrepreneur's control, such as raw material prices, exchange rates, etc. Obviously, the more the business plan depends upon exogenous factors, the riskier it becomes.

2/ SENSITIVITY ANALYSIS

One important risk analysis consists of determining how sensitive the investment is to different economic assumptions. This is done by *holding all other assumptions fixed* and then observing the impact of each economic assumption on the present value. It is a technique that highlights the consequences of changes in *prices*, *volumes*, *rising costs* or *additional investments* on the value of projects.

Firms generally build three scenarios (pessimistic, realistic and optimistic). In certain sectors highly dependent on raw materials or other exogenous factors (such as the price of electricity), investment scenarios are deduced from predetermined macroeconomic scenarios.

The sensitivity analysis requires a good understanding of the sector of activity and its specific constraints. The industrial analysis must be rounded off with a more financial analysis of the investment's sensitivity to the model's technical parameters, such as the discount rate or terminal value (perpetuity growth rate, see Chapter 31).

Practitioners usually build a sensitivity matrix, which offers an overview of the sensitivity of the investment's NPV to the various assumptions.

Other companies prefer to focus on only one scenario, which is analysed in depth in order to keep managers of the project committed.

3/ ASSESSMENT OF THE MAXIMUM RISK

Investors, in particular if they are not familiar with the sector (which is usually the case for financial investors), may be tempted to build a very pessimistic scenario (worst-case scenario or crash test). Nevertheless, this scenario needs to remain realistic and thus cannot be a cumulative sensitivity analysis.

This exercise does not aim to determine a value but rather to assess the risk of failure (and potentially bankruptcy) of the project or to assess the additional investments that would then be needed. This scenario can also be useful to fix the maximum level of debt that the project can take.

Section 30.2 ASSESSING RISK THROUGH A MATHEMATICAL APPROACH

1/ MONTE CARLO SIMULATION

An even more elaborate variation of scenario analysis is the **Monte Carlo simulation**, which is based on more sophisticated mathematical tools and software. It consists of isolating a number of the project's key variables or value drivers, such as turnover or margins, and allocating a probability distribution to each. The analyst enters all the assumptions about distributions of possible outcomes into a spreadsheet. The model then randomly samples from a table of predetermined probability distributions in order to identify the probability of each result.

Assigning probabilities to the investment's key variables is done in two stages. First, influential factors are identified for each key variable. For example, with turnover, the analyst would also want to evaluate sales prices, market size, market share, etc. It is then important to look at available information (long-run trends, statistical analysis, etc.) to determine the uncertainty profile of each key variable using the values given by the influential factors.

Generally, there are several types of key variables, such as simple variables (e.g. fixed costs), compound variables (e.g. turnover = market × market share) or variables resulting from more complex, econometric relationships.

The investment's net present value is shown as an uncertainty profile resulting from the probability distribution of the key variables, the random sampling of groups of variables and the calculation of net present value in this scenario.

Repeating the process many times gives us a clear representation of the NPV risk profile.

Once the uncertainty profile has been created, the question is whether to accept or reject the project. The results of the Monte Carlo method are not as clear cut as present value, and a lot depends upon the risk/reward trade-off that the investor is willing to accept. One important limitation of the method is the analysis of interdependence of the key variables; for example, how developments in costs are related to those in turnover.

2/ THE CERTAINTY EQUIVALENT

The certainty equivalent of a future cash flow is the certain amount that the investor would be ready to accept in exchange for an expected future risky cash flow. For example, if the investor is expecting a project to provide a 1,000 cash flow in one year, given the risk they may consider trading this cash flow for the certainty of getting 600 in one year.

The certainty equivalent method leads to discounting using the risk-free rate and the certainty equivalent cash flows. The net present value of an investment can then be written as:

$$NPV = CF_0 + \sum_{i=1}^{n} \frac{e_i \times CF_i}{(1 + r_F)^i}$$

where e_i is the certainty equivalent factor of cash flow CF_i and r_F the risk-free rate.

To the best of our knowledge, this method remains rarely used in practice.

Section 30.3 THE CONTRIBUTION OF REAL OPTIONS

1/ THE LIMITS OF CONVENTIONAL ANALYSIS

Do not be confused by the variety of risk analysis techniques presented in the preceding section. In fact, all of these different techniques are based on the same principle. In the final analysis, simulations, the Monte Carlo or the certainty equivalent methods are just complex variations on the NPV criteria presented in Chapter 16.

Like NPV, conventional investment risk analyses are based on two fundamental assumptions:

the choice of the anticipated future flow scenario; and

the irreversible nature of the investment decision.

The second assumption brings up the limits of this type of analysis. Assuming that an investment is irreversible disregards the fact that corporate managers, once they get new information, generally have a number of options. They can abandon the investment halfway through if the project does not work out, they can postpone part of it or extend it if it has good development prospects, or they can use new technologies. The teams managing or implementing the projects constantly receive new information and can adapt to changing circumstances. In other words, **the conventional approach to investment decisions ignores a key feature of many investment projects, namely flexibility**.

It might be argued that the uncertainty of future flows has already been factored in via the expected value criterion and the discount rate, and therefore this should be enough to assess any opportunities to transform a project. However, it can be demonstrated that this is not necessarily so.

> The discount rate and concept of expected value quantify the direct consequences of random events. However, they do not take into account the manager's ability to change strategies in response to these events.

2/ REAL OPTIONS

Entrepreneurs are not just passively exposed to risks. In many cases, they are able to react to ongoing events. They can increase, reduce or postpone their investment, and they exercise this right according to ongoing developments in prospective returns.

In fact, the entrepreneur is in the same situation as the financial manager, who can increase or decrease his position in a security given predetermined conditions.

Entrepreneurs who have some leeway in managing an investment project are in the same position as financial managers holding an option.[1]

The flexibility of an investment thus has a value that is not reflected in conventional analysis. **This value is simply that of the attached option.** Obviously, this option does not take the form of the financial security with which you have already become familiar. It has no legal existence. Instead, it relates to industrial assets and is called a **real option**.

> Real options relate to non-financial investments. They represent the right, but not the obligation, to *change* an investment project, particularly when new information on its prospective returns becomes available.

The potential flexibility of an investment, and therefore of the attached real options, is not always easy to identify. Industrial investors frequently do not realise or do not want to admit (especially when using a traditional investment criterion) that they do have some margin for manoeuvre. This is why it is often called a **hidden option**.

3/ REAL OPTIONS CATEGORIES

> The theory of real options is complex but, like any conceptual universe, it helps us to discuss and analyse problems.

Given the potential value of hidden options, it is tempting to consider all investment uncertainties as a potential source of value. But the specific

features of option contracts must not be overlooked. The following three factors are necessary to ensure that an investment project actually offers real options:

The project must have a degree of **uncertainty**. The higher the underlying volatility, the greater the value of an option. If the standard deviation of the flows on a project is low, the value of the options will be negligible.

Investors must be able to get **more information** during the course of the project, and this information must be sufficiently precise to be useful.

Once the new information has been obtained, it must be possible to change the project **significantly and irrevocably**. If the additional information cannot be used to modify the project, the manager does not really have an option but is simply taking a chance. In addition, the initial investment decision must also have a certain degree of irreversibility. If it can be changed at no cost, then the option has no value. And lastly, since the value of a real option stems from the investor's ability to take action, any increase in **investment flexibility generates value**, since it can give rise to new options or increase the value of existing options.

Real options apply primarily to decisions to invest or divest, but they can appear at any stage of a company's development. As a result, the review in this text of options theory is a broad outline, and the list of the various categories of real options is far from exhaustive.

The option to launch a new project corresponds to a call option on a new business. Its strike price is the start-up investment, a component that is very important in the valuation for many companies. In these cases, they are not valued on their own merits, but according to their ability to generate new investment opportunities, even though the nature and returns are still uncertain.

By acquiring a controlling stake in Symbio in 2019, Michelin took an option on the future development of hydrogen as a means of powering vehicles, through the hydrogen-powered fuel cells Symbio develops.

Similarly, R&D departments can be considered to be generators of real options embedded within the company. Any innovation represents the option to launch a new project or product. This is particularly true in the pharmaceutical industry. If the project is not profitable, this does not mean

that the discovery has no value. It simply means that the discovery is out of the money. Yet this situation could change with further developments.

The option to develop or extend the business is comparable to the launch of a new project. However, during the initial investment phase decisions have to be made, such as whether to build a large factory to meet potentially strong demand or just a small plant to test the waters first.

A real options solution would be to build a small factory with an option to extend it if necessary. Flexibility is just as important in current operations as it is when deciding on the overall strategy of a project. Investments should be judged by their ability to offer recurring options throughout their lifecycle. Certain power stations, for example, can easily be adapted to run on gas or oil. This flexibility enhances their value, because they can easily be switched to a cheaper source of energy if prices fluctuate. Similarly, some auto plants need only a few adjustments in order to start producing different models.

The option to reduce or contract business is the opposite of the previous example. If the market proves smaller than expected, the investor can decide to cut back on production, thus reducing the corresponding variable costs. Indeed, the investor can also decide not to carry out part of the initial project, such as building a second plant. The implied sales price of the unrealised portion of the project consists of the savings on additional investments. This option can be described as a put option on a fraction of the project, even if the investment never actually materialises.

The option to postpone a project. The initial investment to get the authorisations to build a wind farm is minimal in comparison with construction costs. It can thus be quite useful to defer the start of the project, for example until the business environment becomes more propitious (electricity prices, operating costs, etc.). To a certain extent, this is similar to holding a well-known but not fully exploited brand.

There is a certain time value in delaying the realisation of a project, since in the meantime better information about the project's income and expenses may become available. This enables a better assessment of the potential for value creation.

Nonetheless, the option to defer the project's start is valid only if the investor is able to secure ownership of the project from the outset. If not, competitors may take on the project. In other words, the advantage of deferring the investment could be cancelled out by the risk of new market entrants.

Looking beyond the investment decision itself, **option models can be used to determine the optimal date for starting up a project**. In this case, the waiting period is similar to holding an American option on the project. The option's value corresponds to the price of ensuring future ownership of the project (land, patents, licence, etc.).

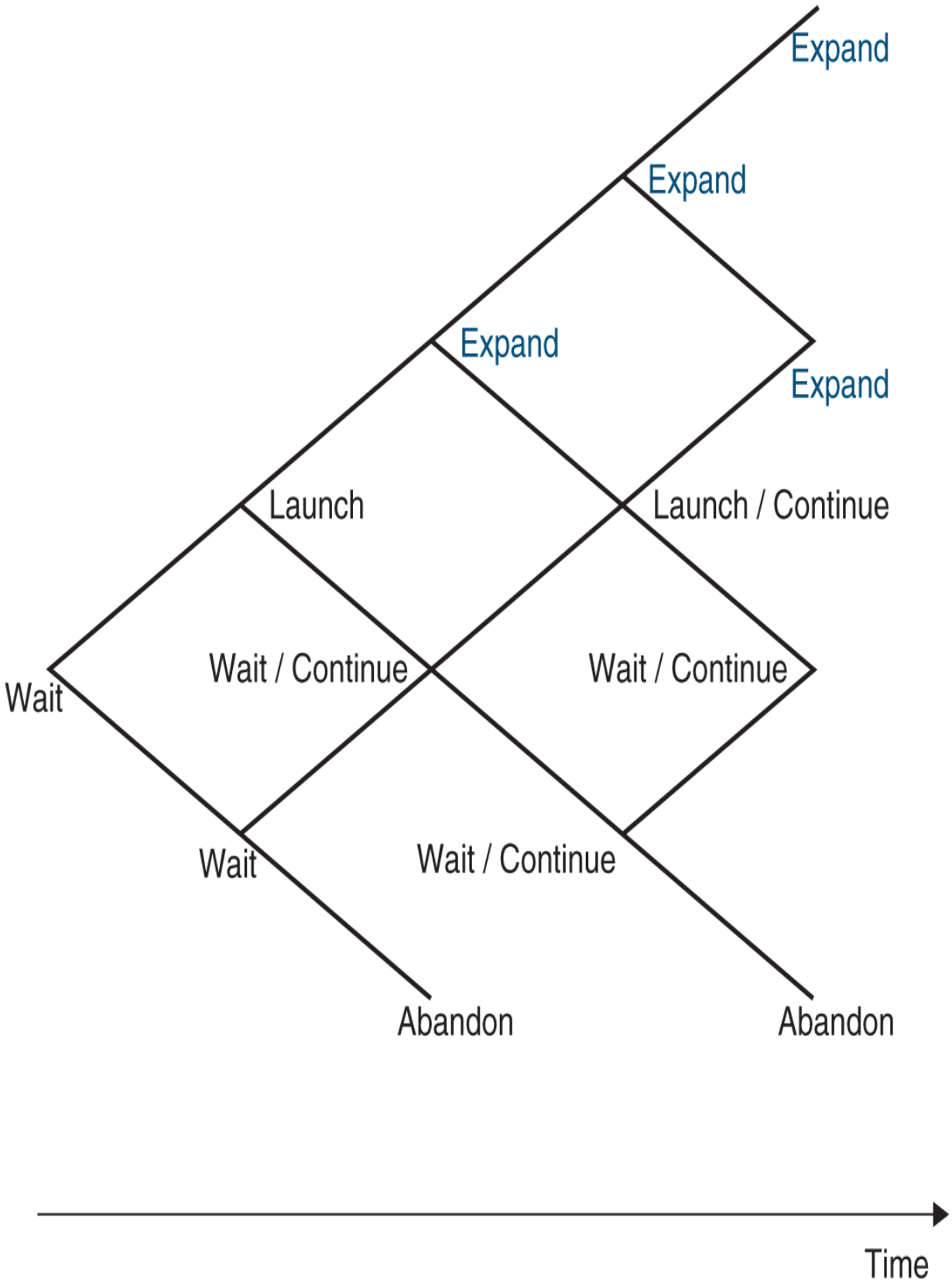
The option to defer progress on the project is a continuation of the previous example. Some projects consist of a series of investments rather than just one initial investment. Should investors receive information casting doubt on a project that has already been launched, they may decide to put subsequent investments on hold, thus effectively halting further development. In fact, investors hold an option on the project's further development at every call for more financing.

The option to abandon means that the industrial manager can decide to abandon the project at any time. Thus, hanging on to it today means keeping open the option to abandon at a later date. However, the reverse is not possible. This asymmetry is reflected in options theory, which assumes that a manager can sell the project at any time (but might not be able to buy it back once it is sold).

Such situations are analogous to the options theory of equity valuations that we will examine in Chapter 34. If the project is set up as a levered company, then the option to abandon corresponds to shareholders' right to default. The value of this option is equal to that of equity, and it is exercised when the amount of outstanding debt is greater than the value of the project.

In the example below, the project includes an option to defer its launch (wait and see), an option to expand if it proves successful and an option to abandon it completely.

Option to defer – option to expand – option to abandon



4/ EVALUATING REAL OPTIONS

Option theory sheds light on the valuation of real options by stating that uncertainty combined with flexibility adds value to an investment opportunity. How appealing! It tells us that the higher the underlying volatility, and thus the risk, the greater the value of an option. This appears counterintuitive compared with the net present value approach, but remember that this value is very unstable. The time value of an option decreases as it reaches its exercise date, since the uncertainty declines with the accumulation of information on the environment.

> The uncertainty inherent in the flexibility of an investment opportunity creates value, because the unknown represents risk that has a time value. As time passes, this uncertainty declines as the discounted cash flows are adjusted with new information. The uncertainty is replaced with an intrinsic value that progressively incorporates the ever-changing expectations.

Consider the case of a software publisher that is offered the opportunity to buy a licence to market (after development) connected homes software for £5m. If the publisher does not accept the deal right away, the licence will be offered to a rival. The software can be developed on the spot at a cost of £50m.

If the software is developed immediately, the company should be able to generate £2m in cash flows over the next year. The situation the following year, however, is far more uncertain, since one of the main equipment suppliers for connected homes is due to choose a new technological standard. If the standard chosen corresponds to that of the licence offered to our company, it can hope to generate a cash flow of £9m per year. If another standard is chosen, the cash flows will plunge to £1m per year. The management of our company estimates there is a 50% chance that the "right" standard will be chosen. As of the second year, the flows are expected to be constant to infinity.

The present value of the immediate launch of the product can easily be estimated with a discount rate of 10%. The anticipated flows are $0.5 \times 9 + 0.5 \times 1 = £5$m from the second year on to infinity. Assuming that the first

year's flows are disbursed (or received) immediately, that second-year flows are disbursed (or received) at the very beginning of the second year and so on, the present value is 5 / 0.1 + 2 = £52m for a total cost of 50 + 5 = £55m. According to the NPV criterion, the project destroys £3m in value and the company should reject the licensing offer.

This would be a serious mistake!

If it buys the licence, the company can decide to develop the software whenever it wants to and can easily wait a year before investing in production. While this means giving up revenues of £2m in the first year, the company will have the advantage of knowing which standard the equipment supplier will have chosen. It can thus decide to develop only if the standard is suited to its product. If it is not, the company abandons the project and saves on development costs. The licence offered to the company thus includes a real option: the company is entitled to earn the cash flows from the project in exchange for investing in development.

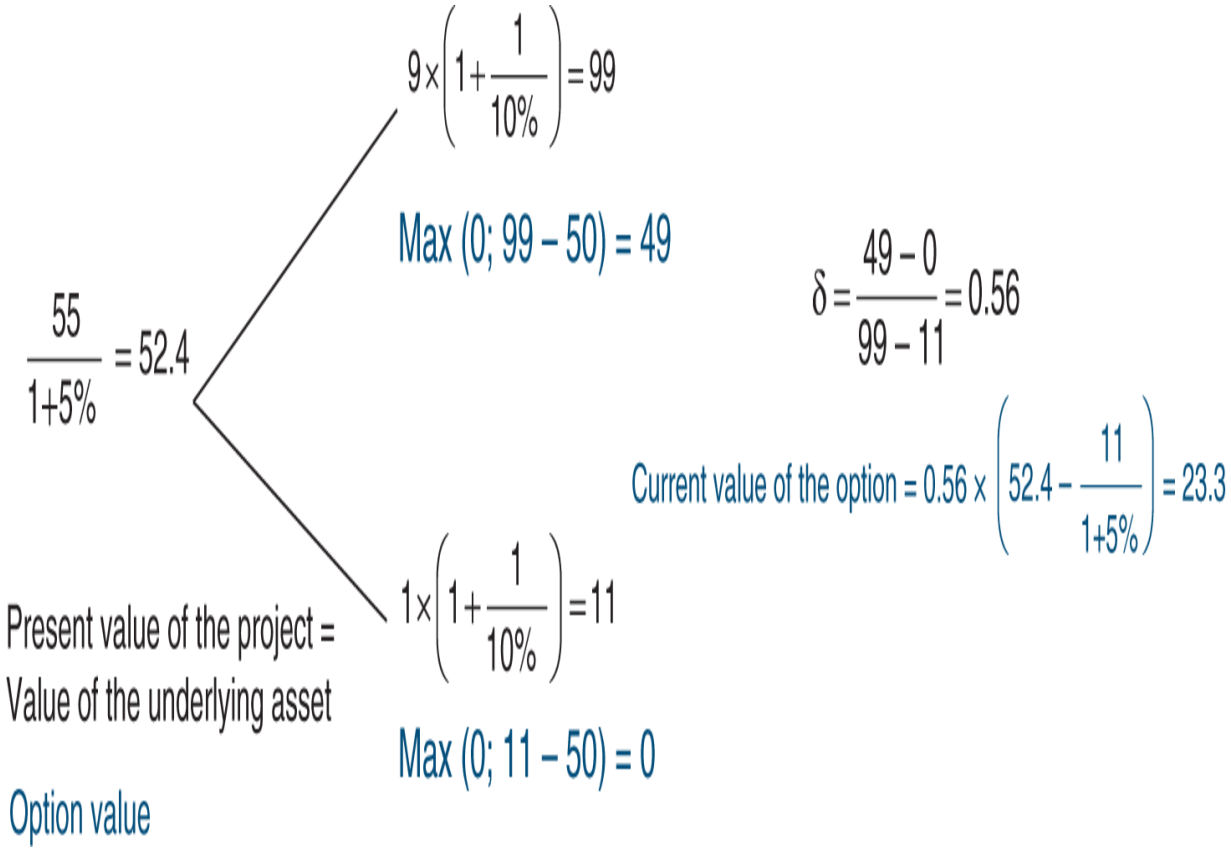
The NPV approach assumes that the project will be launched immediately. That corresponds to the immediate exercise of the call option on the underlying instrument. This exercise destroys the time value. To assess the real value of the licence, we have to work out the value of the corresponding real option, i.e. the option of postponing development of the software.

> When a company has a real option, using NPV or any other traditional investment criterion implies that it will exercise its option immediately. It is important to keep in mind that this is not necessarily the best solution or the only reality that the company/investor faces.

The value of an option can be determined by the binomial method, which we described in greater detail in Chapter 23.

Imagine that the company has bought the licence and put off developing the software for a year. It now knows what standard the carrier has chosen. If the standard suits its purposes, it can immediately start up development at an NPV of 9 × (1 + 1 / 0.1) − 50 = £49m at that date. If the wrong standard is chosen, the NPV of developing the software falls to 1 × (1 + 1 / 0.1) − 50 = −£39m, and the company drops the project (this investment is irreversible

and has no hidden options). The value of the real option attached to the licence is thus £49m for a favourable outcome and 0 for an unfavourable outcome. Using a risk-free discount rate of 5%, the calculation for the initial value of the option is £23.3m, since:



Here is another look at the licensing offer. The licence costs £5m and the value of the real option is £23.3m, assuming development is postponed for one year. With this proviso, the company has been offered the equivalent of an immediate gain of 23.3 − 5 = £18.3m.

In this example, the difference between the two approaches is considerable. Legend has it that when an oil concession was once being auctioned off, one of the bidding companies offered a price that was less than a tenth of that of its competitor, quite simply because he had “forgotten” to factor in the real options!

This example assumed just one binomial alternative but, when attempting to quantify the value of real options in an investment, one is faced by a myriad of alternatives. More generally, the binomial model uses the replicating portfolio approach, which requires the use of quite sophisticated

mathematical tools. Estimating volatility is always a problematic issue with respect to the concrete application of this methodology. In addition, the method requires defining a convenience yield that represents the interest in holding an asset at a certain point in time given its expected return.

In practice, the information derived from the quantification of real options is frequently not very significant when compared with a highly positive NPV in the initial scenario. However, when NPV is negative at the outset, one always has to consider the flexibility of the project by resorting to real options.

5/ THE EXPANDED NET PRESENT VALUE

Since options allow us to analyse the various risks and opportunities arising from an investment, the project can be assessed as a whole. This is done by taking into account its two components – anticipated flows and real options. Some authors call this the **expanded net present value (ENPV)**, which is the opposite of the "passive" NPV of a project with no options. ENPV is equal to the NPV grossed up with the value or real options of the investment.

When a project is very complex with several real options, the various options cannot be valued separately since they are often conditional and interdependent. If the option to abandon the project is exercised, then the option to reduce business obviously no longer exists and its value is nil. As a result, there is no additional value on options that are interdependent.

6/ CONCLUSION

The predominant appeal of real options theory is its factoring of the value of flexibility that the traditional approaches ignore. The traditional net present value approach assumes that there is only one possible outcome. It does not take into account possible adaptive actions that could be taken by corporate managers. Real options fill this gap.

But do not get carried away; applying this method can be quite difficult because:

not everyone knows how to use the mathematical models. This can create problems in communicating findings; and

estimating some of the required parameters, such as volatility, opportunity costs, etc., can be complicated.

> If not properly applied, real options can give very high values. In turn, these can be used to justify the unjustifiable, e.g. stock prices during the Internet bubble in 2000 or IPO prices for biotech companies in recent years. Their main advantage is that they force users to reason “outside of the box” and come up with new ideas.

We trust that the reader will not mind being told that the use of these tools by practitioners is inversely correlated to the place devoted to them in this chapter: virtually systematic for scenarios, less often for the Monte Carlo method and very rarely for real options.

Section 30.4 WHAT IF THE RISK WAS YOU?

Investment decisions in companies are rarely made by machines, but by human beings, who are naturally subject to cognitive biases, leading to systematic errors in reasoning without us really being aware of them. Their existence was highlighted by the research of psychologists and economists D. Kahneman and A. Tversky, who laid the foundations for the development of a new way of thinking called behavioural finance, which R. Thaler has strongly developed.

1/ COGNITIVE BIASES IN THE INVESTMENT DECISION

There are many such biases, both in the analysis phase of a project and in the decision phase. We will therefore only mention the main ones, which, as you will see, do not all point in the same direction.

Confirmation bias consists of seeing in the environment only the favourable elements that reinforce your conviction, those that you want to see and hear, you even actively seek them out; and neglecting, or even ignoring, those that contradict your thesis.

The **risk aversion** of managers tends to increase the further you get from the senior management of the company. Indeed, the success of a project will affect the career of an employee in charge of it much more than that of an executive directly and indirectly responsible for 10 projects, not to mention that of the ultimate leader whose personal future will depend on the success or failure of hundreds of investment projects. Here we find the notion of diversification. As a result, core managers will kill many projects, often with positive net present value, for fear that their possible failure will affect them strongly, while a success will be considered normal. We suggest that you answer question 12 in this chapter for an illustration, where you will see that most managers are more sensitive to a given loss than to a given success of the same amount.

The **overconfidence bias** or **optimism bias** that makes you ignore the response that your competitors are bound to have to the new product you are launching, which makes you confuse “managerial voluntarism with optimism about factors that are beyond the company's control” (Sibony,

2020). As an investor, we do not remember seeing a pessimistic business plan! Question 13 of this chapter is for you.

The **group bias** that often makes those of a different opinion hesitate within a group and more often than not leads them to keep their objections quiet, when they could highlight neglected aspects that could prove crucial. This is regularly confirmed in the classroom, where the second student asked the same question will most often respond in the same way as the first student, let alone the third or fourth.

The **interest bias** that makes you defend your division's investment project, because it is your division's, making you forget to take into account the group's interest, especially when it differs; or the investment banker who will not point out the negative elements of a merger that could dissuade his client from concluding it when his remuneration depends on it. To quote D. Ariely (2013): “We cheat to the extent that we can maintain the image of a reasonably honest person in our own eyes”.

2/ HOW TO LIMIT COGNITIVE BIASES IN THE INVESTMENT DECISION

In a study of 1,048 investment decisions, D. Lovallo and O. Sibony (2010) showed that the way in which the investment decision was made accounted for 53% of the variance in the profitability of the investment, compared with only 8% for the analyses of the investment. In other words, the way in which the investment decision is made explains 7 times more of its final profitability than its analysis itself.

Armed with this observation, and knowing that it is futile for an individual to try to identify and eliminate his cognitive biases, since by construction they are largely unconscious, O. Sibony (2020) makes three recommendations to improve investment decision-making and reduce the risk of failure:

Organise dialogue to encourage the confrontation of points of view. The final decision-maker could thus ensure the diversity of skills and profiles of the members of the investment committee; take time for debate by blocking agendas for half a day or the day; clearly distinguish between projects submitted for discussion at this session and those submitted for decision, in order to avoid hasty conclusions and lack of maturation; give preference to the summary note rather than the Powerpoint presentation, which puts the debate to sleep and freezes it; Require project leaders to present several sets of projects; failing that, present an alternative story of why this project might be rejected or prepare a pre-mortem that describes a few years later why this project failed, in order to highlight the uncertainty inherent in decision-making; replace the management committee for decision-making with an ad-hoc committee of company executives from different functions who will escape the political games played within the exco. Thus informed, the final decision-maker will be able to make better decisions.

Decentring to see the facts from another angle, and limit bias. The final decision-maker will thus maintain in the organisation, by promoting them, unconventional personalities who do not hesitate to systematically say what they think, maintain informal networks, call on experts, consultants, or even solicit another team in the company to deconstruct the investment project or solicit the opinion of employees by relying on the wisdom of crowds. And to avoid losing sight of the facts through the multiplication of contradictory points of view, the final decision-maker standardises the presentation formats, defines the decision criteria in advance, carries out stress tests on the hypotheses, and above all cultivates the humility that is the first quality of a good financier.

Foster agility in decision-making. The final decision-maker will carry out real experiments, develop progressive commitments before making the final decision, reclaim the right to fail by first showing his own to evacuate the fear of failure in his collaborators. And the best advice is to make the final decision the morning after the final investment committee. It's never clearer then!

SUMMARY

The summary of this chapter can be downloaded from www.vernimmen.com.

Traditional risk analysis methods are all based on the principle of free cash flow discounting. They are applicable when all investment decisions are irreversible and projects have no flexibility.

With breakeven analysis, the manager or the analyst tries to understand the level of output and revenues that must be reached in order to break even. It is an important tool for a manager, because it can set very clear targets. It is convenient to use this method by considering all fixed costs, including financial expenses.

Sensitivity analysis allows the manager to understand how sensitive the NPV is to changes in assumptions on key value drivers, while holding everything else constant.

Scenario analysis changes multiple assumptions simultaneously. In this manner, the analyst must make some effort in estimating which variables move together, as well as the intensity of their relationship. Using the Monte Carlo method, a better idea of the prospects of flows can be obtained by allocating a probability distribution to each of them. Although powerful, the method is not so easy to interpret and can be misused.

The limitations of all these methods become evident when project managers are able to use new information to modify a project that is already under way, i.e. when there is a certain amount of flexibility. In such cases, the industrial manager is in the same situation as the financial manager who can increase or decrease his position in a security given predetermined conditions. An industrial manager can also be compared to a financial manager who holds an option. The flexibility of an investment has a value – the value of the option attached to it. This concrete property of a flexible investment is a real option.

Three factors are necessary to ensure that an investment project actually offers real options:

there is some uncertainty surrounding the project;

there is additional information arriving over the course of time; and

it must be possible to make significant changes to the project on the basis of this information.

A number of different types of real options can be present in investment projects:

the option to launch a new project;

the option to expand, reduce or abandon the project; or

the possibility to defer the project or delay the progress of work.

The study of investments on the basis of their net present value can be expanded thanks to the concept of the real option. The result we obtain by including real options in the analysis is known as expanded net present value. This is the sum of the net present value of the project and the real options attached to the project. The uncertainty inherent in the flexibility of an investment opportunity creates value, but this uncertainty declines as time goes by. The uncertainty is replaced by the intrinsic value arising from the discounted flows adjusted for the new information.

Real options are of unquestionable intellectual value; they allow one to think outside the box of simple net present value, to think differently and thus to have new ideas. However, the concrete application of the concept is often tricky and can lead to heresy.

But does the risk not lie first and foremost in the cognitive biases that make us make systematic errors in reasoning without our being aware of them? Confirmation bias, which consists of seeing in the environment only those elements that reinforce your conviction, risk aversion, which increases the further away you are from the top of the company, optimism and overconfidence bias, group bias, which leads objections to remain silent, and interest bias, to mention only the main ones.

To counteract cognitive biases, it is necessary to organise dialogue to encourage the confrontation of points of view before the decision is made, to decentralise in order to see the facts from another angle, and to encourage agility in decision-making, without forgetting humility in the

face of the facts, which is the first quality of a good finance professional.

QUESTIONS

1/How does using different scenarios differ from simple cash flow discounting?

2/In a simplified form, can the Monte Carlo method be implemented without a computer?

3/What is interesting in the certainty equivalent method?

4/What does the theory of options contribute to the valuing of an investment?

5/Is the theory of options opposed to the theory of efficient markets?

6/Can a project that contains significant real options be valued properly by the NPV criterion? By the construction of scenarios? By the Monte Carlo method? By the certainty equivalent method?

7/Provide an example of a project where there is an option to abandon.

8/Provide an example of a project where there is an option to expand.

9/In practice, what is the most serious problem raised by real options?

10/What makes the contribution of real options attractive for operations managers?

11/How do you interpret the acquisition by EDF of plots of land adjacent to British Energy nuclear plants a few months before the UK privatised this company (knowing that this land was necessary for the modernisation of the nuclear plants)?

12/An investment of €100m gives you the expectation of either a present value of future cash flows of €400m or of €0m. What would be the maximum probability of the second case occurring, which would allow you to make the investment?

13/Compared to the median of car drivers, are you in the top 50% or the bottom 50%?

You'll find more questions at www.vernimmen.com.

EXERCISE

1/An Internet portal aimed at pet owners has just developed a nuclear sewing machine and offers you the opportunity to invest in the industrialisation of this product. The project will last five years, and for four years you will not be paid a dividend. But if the company is floated on the stock exchange after five years (which is the plan), you will get €5m. The founders of the portal estimate that your initial investment will be about €2.5m.

What return will this project bring you?

Given the project's risk, you decide that you require a return of more than 20%. What investment do you offer?

The founders, keen to obtain the €2.5m in question and believing firmly in the success of their project, offer you the following arrangement: you give them €2.5m and, if all goes well, you'll get €5m after five years. If the project fails, then they'll give you €1m after five years out of the €2.5m you invested. They believe that this reduces your risk considerably. How would you go about tackling this problem (without doing any calculations)?

ANSWERS

Question

1/*The assumptions are obvious.*

2/*No.*

3/*Certainty equivalent factors can vary according to each cash flow (this would be equivalent to a variable discount rate in the standard NPV method).*

4/*The valuation of management's margin for manoeuvre.*

5/*No.*

6/*No, no, no, no.*

7/*Definitive closure of a mine.*

8/*Buy a plot of land that is too big for the plant to be constructed, in order to be able to cater for a growing market.*

9/*Valuing the alternatives.*

10/*They highlight flexibility and the ability to adapt to a new environment.*

11/*It's a real option that provides a certain gain: even though EDF did not win the auction, it would have been able to favourably negotiate the disposal of the land to the new owner of British Energy. It therefore increased the cost of British Energy for other bidders in the auction.*

12/*Rationally 75%, because the NPV is then zero: –100 + 25% × 400 + 75% × 0 = 0.*

Only 9% of the managers surveyed are prepared to accept a probability of more than 40%, which illustrates their individual risk aversion.

13/*More than 90% of the respondents put themselves in the top 50% of drivers, which illustrates the overconfidence bias.*

Exercise

A detailed Excel version of this solution is available at www.vernimmen.com.

1/*IRR = 14.87%. Around €2m. The founders' offer could be compared to a put option on the project with a strike price of €1m. The whole problem lies in the valuation of this option (the volatility of the value of the project must be evaluated). The founders value it at €0.5m. The option that they're "offering" you does, in fact, reduce your risk, since your loss is now limited to €1.5m compared with €2.5m previously.*

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NOTE

1 *If you are not familiar with options, we advise you to read Chapter 23 before reading the rest of this chapter*.

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Chapter 31
VALUATION TECHNIQUES

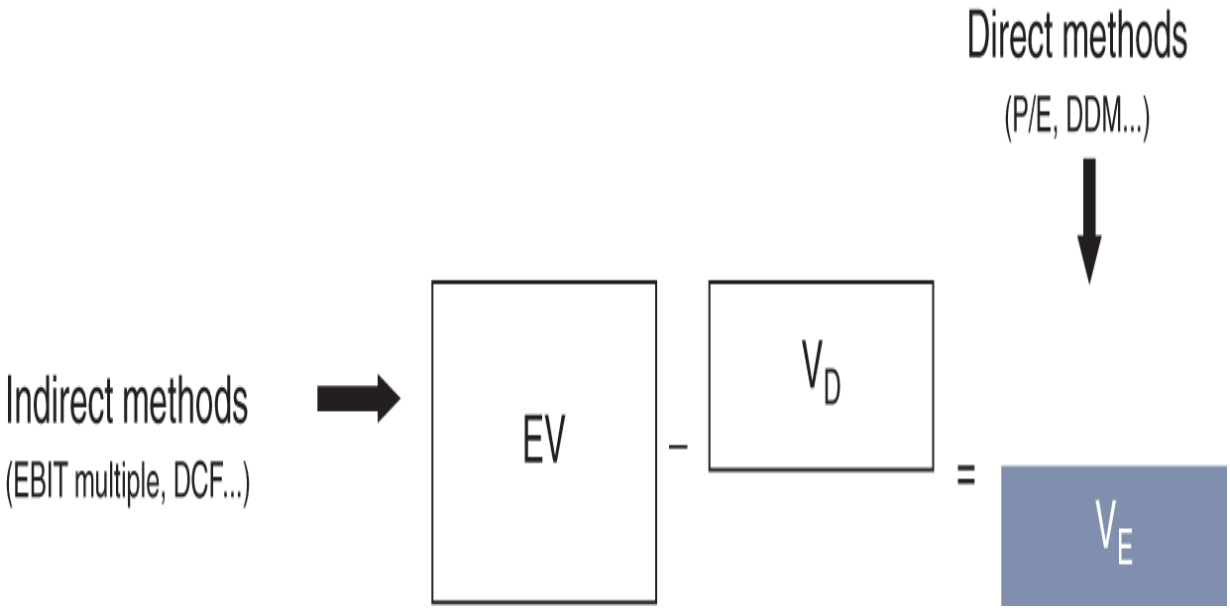
That endless quest for fair value

Although you might not realise it, you already have the knowledge of all the tools that you will need to value a company. You discovered what discounting was about in Chapter 16 and learnt all about the right discount rate to use in Chapters 19 and 29. Finally, the comparable method was explained in Chapter 22. This chapter contains an in-depth look at the different valuation techniques and presents the problems (and solutions!) you will probably encounter when using them. Nevertheless, we want to stress that valuation is not a simple use of mathematical formulae, it requires the valuator to have good accounting and tax skills. You will also need to fully understand the business model of the firm to be valued in order to assess the reliability of the business plan supporting the valuation. Reading this chapter will only be a first step towards becoming a good valuator and, in addition, a great deal of practice and application will be needed.

Section 31.1 OVERVIEW OF THE DIFFERENT METHODS

Generally, we want to value a company in order to determine the value of its shares or of its equity capital.

Broadly speaking, there are two methods used to value equity: the direct method and the indirect method. In the direct method, obviously, we value equity directly. In the indirect method, we first value the firm as a whole (what we call “enterprise” or “firm” value), then subtract the value of net debt to get the equity value.



In addition, there are two approaches used in both the direct and indirect methods:

The fundamental approach based on valuing either:

- a stream of dividends, which is the **dividend discount model (DDM)**; or
- a stream of free cash flows, which is the **discounted cash flow (DCF) method**.

This approach attempts to determine the company's intrinsic value, in accordance with financial theory, by discounting cash flows to their present value using the required rate of return.

The pragmatic approach of valuing the company by analogy with other assets or companies of the same type for which a value reference is available. This is the peer comparison method (often called the comparables method). Assuming markets are efficient, we should be able to infer the value of a company from the value of others.

	Indirect approach	Direct approach
Intrinsic value method (discounted present value of financial flows)	Present value of free cash flows discounted at the weighted average cost of capital (k) – value of net debt	Present value of dividends at the cost of equity: k_E
Peer comparison method (multiples of comparable companies)	EBITDA/EBIT multiple × EBITDA/EBIT – value of net debt	P/E × net income

The **sum-of-the-parts method** consists of valuing the company as the sum of its assets less its net debt. However, this is more a combination of the techniques used in the direct and indirect methods rather than a method in its own right.

Lastly, we mention options theory, whose applications we have seen in Chapter 30 and will see in Chapter 34. In practice, very few will value equity capital by analogy to a call option on the assets of the company. The concept of real options, however, had its practical heyday at the height of the stock market folly of 1999 and 2000, to explain the market values of “new economy” stocks. Needless to say, this method has since fallen out of favour (but may come back to justify the valuation of some tech groups today).

If you remember the efficient market hypothesis, you are probably asking yourself why market value and discounted present value would ever differ. In this chapter we will take a look at the origin of the difference, and try to understand the reason for it and how long we think it will last. Ultimately, market values and discounted present values should converge.

Section 31.2 VALUATION BY DISCOUNTED CASH FLOW

The **discounted cash flow method** (DCF) consists of applying the investment decision techniques (see Chapter 16) to the firm value calculation. We will focus on the **present value** of the cash flows from the investment. This is the **fundamental valuation method (or intrinsic method)**. Its aim is to value the company as a whole (i.e. to determine the value of the capital employed, what we call enterprise value). After deducting the value of net debt, the remainder is the value of the company's shareholders' equity.

As we have seen, the cash flows to be valued are the after-tax amounts produced by the firm. They should be discounted out to perpetuity at the company's weighted average cost of capital (see Chapter 29):

$$EV = \sum_{t=0}^{\infty} \frac{FCFF_t}{(1+k)^t}$$

In practice, we project specific cash flows over a certain number of years. This period is called the **explicit forecast period**. The length of this period varies depending on the sector. It can be as short as two to three years for a high-tech company, five to seven years for a consumer goods company and as long as 20 to 30 years for a utility. For the years beyond the explicit forecast period, we establish a **terminal value**.

> The value of the firm is the sum of the present value of after-tax cash flows over the explicit forecast period and the present value of the terminal value at the end of the explicit forecast period.

1/ SCHEDULE OF FREE CASH FLOWS

Free cash flows measure the cash-producing capacity of the company. Free cash flows are estimated as follows:

Operating income (EBIT)	Reasoning at the operating level
+ Depreciation	Because depreciation, deducted to produce EBIT, does not entail cash outflows
– Normalised tax on operating income	Equal to operating income × average corporate income tax rate
– Change in working capital	Going from accounting to cash flows
– Capital expenditure	The firm is developing
= Free cash flow to firm	

You buy a company for its future, not its past, no matter how successful it has been. Consequently, future cash flows are based on projections contained in the business plan of the company. As they will vary depending on growth assumptions, the most cautious approach is to set up several scenarios. But for starters, are you the buyer or the seller? The answer will influence your valuation. The objective of negotiation is to reconcile the buyer's and seller's points of view. We have found in our experience that discounted cash flow analysis is a very useful discussion tool: the seller gets accustomed to the idea of selling their company and the buyer gets a better understanding of the company for sale.

It is all right for a business plan to be optimistic – our bet is that you have never seen a pessimistic one – the important thing is how it stands up to scrutiny. It should be assumed that competition will ultimately eat into margins and that increases in profitability will not be sustained indefinitely without additional investment or additional hiring. Quantifying these crucial future developments means entering the inner sanctum of the company's strategy.

(a) Business plan horizon

The length of the explicit forecast period will depend on the company's “visibility” – i.e. the period of time over which is it reasonable to establish

projections. This period is necessarily limited. In 10 years' time, for example, probably only a small portion of the company's profits will be derived from the production facilities it currently owns or from its current product portfolio. The company will have become a heterogeneous mix of the assets it has today and those it will have acquired over the next 10 years.

The forecast period should therefore correspond to the time during which the company will live off its current configuration. If it is too short, the terminal value will be too large and the valuation problem will only be shifted in time. Unfortunately, this happens all too often. If it is too long (more than 10 years), the explicit forecast is reduced to an uninteresting theoretical extrapolation.

Let's look at ArcelorMittal's financial projections and its stock trend chart. Below are a few projections that we made for teaching purposes, building on analysts' consensus.

($m)	**2020**	**2021e**	**2022e**	**2023e**	**2024e**	**2025e**
Profit and loss statement						
Turnover	53,270	68,521	60,503	58,025	57,811	57,827
EBITDA[1]	4,301	15,008	9,114	6,859	6,713	6,551
− Depreciation and amortisation	2,960	2,536	2,536	2,536	2,590	2,590
= EBIT	1,341	12,472	6,578	4,323	4,123	3,961
Balance sheet						
Fixed assets	45,398	45,486	46,435	47,258	47,847	48,511
+ Working capital	2,805	4,200	4,522	4,589	4,664	4,755
= Capital employed	48,203	49,686	50,957	51,847	52,511	53,266
Operating margin after 20% tax	1.9%	13.7%	8.2%	5.6%	5.3%	5.1%
ROCE after 20% tax	2.1%	18.8%	9.7%	6.3%	5.9%	5.6%

It should be noted that the ROCE at the end of the period (5.6%) is much lower than the cost of capital (10%) but on average over the period 2021–2025 (9.2%) it is quite close.

Projected after-tax free cash flows are as follows:

($m)	2020	2021e	2022e	2023e	2024e	2025e
EBIT	1,341	12,472	6,578	4,323	4,123	3,961
− Corporate income tax at 25%	335	3,118	1,645	1,081	1,031	990
+ Depreciation and amortisation	2,960	2,536	2,536	2,789	2,800	2,912
− Capital expenditure	2,439	2,900	3,000	3,000	3,075	3,152
− Changes in working capital	–1,841	1,395	322	67	75	91
= Free cash flow	3,368	7,595	4,148	2,964	2,742	2,640

Using a weighted average cost of capital of 10%, the end-2020 present value of the free cash flows generated during the explicit forecast period (2021–2025) is $16,071m.

Some practitioners discount cash flows over half years; the formula then becomes:

$$V = \sum_{i=1}^{\infty} \frac{FCFF_i}{(1+k)^{i-0.5}}$$

This assumes that cash flows are cashed in "on average" at half-year and that the valuation is performed at the beginning or end of the year.

(b) Terminal value

It is very difficult to estimate a terminal value because it represents the value at the date when existing business development projections will no longer have any meaning. Often analysts assume that the company enters a phase of maturity after the end of the explicit forecast period. **In this case, the terminal value can be based either on the capital employed or on the free cash flow in the last year of the explicit forecast period.**

The most commonly used terminal value formula is the Gordon–Shapiro formula. It consists of a normalised cash flow, or annuity, that grows at a rate (g) out to perpetuity:

Value of the company at the end of the explicit forecast period

$$= \frac{\text{Normalised free cash flow}}{k - g}$$

However, the key challenge is in choosing the normalised free cash flow value and the perpetual growth rate. **The normalised free cash flow** must be consistent with the assumptions of the business plan. It depends on long-term growth, the company's investment strategy and the growth in the company's working capital. Lastly, normalised free cash flows may be different from the free cash flow in the last year of the explicit forecast period, because normalised cash flow is what the company will generate after the end of the explicit forecast period and will continue to generate to perpetuity.

Concerning the growth rate to perpetuity, do not get carried away:

Apart from the normalised cash flow's growth rate to perpetuity, you must take a cold, hard look at your projected long-term growth in return on capital employed. How long can the economic profit it represents be sustained? How long will market growth last?

Most importantly, the company's rate of growth to perpetuity cannot be significantly greater than the long-term growth rate of the economy as a whole. For example, if the anticipated long-term inflation rate is 2% and real GDP growth is expected to be 2%, then if you choose a growth rate g that is greater than 4%, you are implying that the company will not only outperform all of its rivals but also eventually take control of the economy of the entire country or indeed of the entire world (trees do not grow to the sky)![2]

In the case of ArcelorMittal, the normalised cash flow must be calculated for the year 2026, because we are looking for the present value at the end of 2025 of the cash flows expected in 2026 and every subsequent year to perpetuity. Given the necessity to invest if growth is to be maintained, you could use the following assumptions to determine the normalised cash flow:

Normalised cash flow	
Normalised 2026 EBIT	4,040
– Corporate income tax at 25%	1,010
+ Depreciation and amortisation	2,970
– Capital expenditure	3,100
– Change in working capital	93
= Normalised 2026 free cash flow	2,808

Using a rate of growth to perpetuity of 2%, we calculate a terminal value of $35,095m. Discounted over five years, this gives us $21,791m at the end of 2020. The enterprise value of ArcelorMittal is therefore $16,071m + $21,791m, or $37,863m. Note that the terminal value of $35,095m at end-2025 corresponds to a multiple of 8.9 times 2025 EBIT. This means that choosing a multiple of 8.9 is theoretically equivalent to applying a growth rate to perpetuity of 2% to the normalised cash flow and discounting it at the required rate of return of 10%.

Given a net debt of $14,000m, the equity value of ArcelorMittal as at end-2020 works out, with this method, at $23,863m.

Sometimes the terminal value is estimated based on a multiple of a measure of operating performance. This measure can be, among other things, turnover, EBITDA or EBIT. Generally, this “horizon multiple” is lower than an equivalent, currently observable, multiple. This is because it assumes that, all other things being equal, prospects for growth decrease with time, commanding a lower multiple. **Nevertheless, since using this method to assess the terminal value implies mixing intrinsic values with comparative values, we strongly advise against it.**

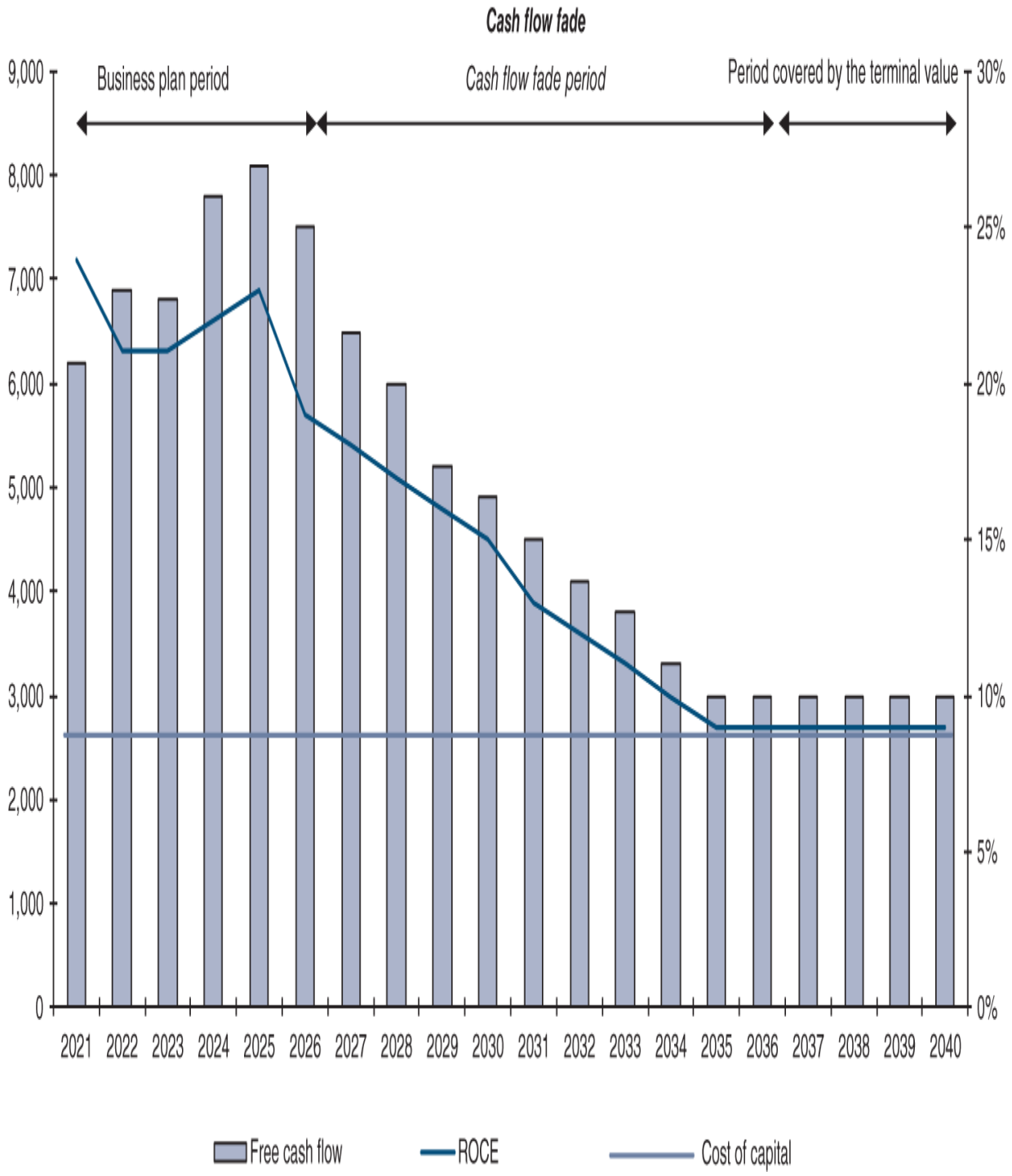
Computing the terminal value with a multiple prevents you from pondering over the level of ROCE that the company can maintain in the future.

Remember that if you compute a terminal value greater than book value, you are implying that the company will be able to maintain forever a return on capital employed in excess of its weighted average cost of capital. If you

choose a lower value, you are implying that the company will enter a phase of decline after the explicit forecast period and that you think it will not be able to earn its cost of capital in the future. Lastly, if you assume that terminal value is equal to book value, you are implying that the company's economic profit[3] falls immediately to zero. This is the method of choice in the mining industry, for example, where we estimate a liquidation value by summing the scrap value of the various assets – land, buildings, equipment – less the costs of restoring the site.

In the case of ArcelorMittal, the capital employed end-2025 is $53,266m, and discounted over five years at 10% results in $33,074m. With this method, the enterprise value as at end-2020 becomes 16,071 + 33,074 = $49,145m.

Generally speaking, no economic profit can be sustained forever. The company's expected return on capital employed must gradually converge towards its cost of capital. This is the case with Coca-Cola, Michelin or British Airways. Regardless of the calculation method, the terminal value must reflect this. To model this phenomenon, we recommend using a “cash flow fade” methodology. In this approach, you define a time period during which the company's return on capital employed diminishes, either because its margins shrink or because asset turnover declines. Ultimately, the ROCE falls down to the weighted average cost of capital. At the end of this time period, the enterprise value is equal to the book value of capital employed.



Readers will have to make choices: length of the cash flow fade period or speed of the convergence towards the cost of capital (form of the ROCE curve: convex, concave or a straight line as in our graph). They might also think that the company will be in a position to earn 1% or 2% more than its

cost of capital due to the strength of its strategic position in its markets. Economic theory would not approve that!

This model can also be used for value-destroying companies. Sooner or later, there will be restructurings and bankruptcies triggering improvements in ROCE, but before applying the cash flow fade method the other way around, our readers would be well advised to ask themselves whether or not their company will be among the survivors!

2/ CHOOSING A DISCOUNT RATE

As we value cash flow to the firm, the discount rate is the **weighted average cost of capital (WACC)** or simply the cost of capital, which corresponds to the minimum rate of return required by the company's fund providers, i.e. shareholders and lenders to finance the company's capital employed. You may want to turn back to Chapter 29 for a more detailed look at this topic.

3/ THE VALUE OF NET DEBT

Once you obtain the enterprise value using the above methodology, you must remove the value of net debt taken at the date just before the start of the cashflows to be discounted (e.g. at 31 December 2020 for cashflows starting in 2021) to derive equity value. Net debt is composed of the value of all financial debt net of cash, i.e. of all bank borrowings, bonds, debentures and other financial instruments[4] (short, medium or long-term), net of cash, cash equivalents and marketable securities.

Theoretically, the value of net debt is equal to the value of the future cash outflows (interest and principal payments) it represents, discounted at the market cost of similar borrowings. When all or part of the debt is listed or traded over the counter (listed bonds, syndicated loans), you can use the market value of the debt. You then subtract the market value of cash, cash equivalents and marketable securities.

The book value of net debt is often used as a first approximation of its present value. Nevertheless, in some cases, the value of debt can differ materially from its book value:

when the firm has borrowed at fixed rates (directly after having swapped floating-rate debt) and rates have evolved since then;

when the company's solvency situation has significantly changed (for better or worse) since it has contracted the debt and there has been no spread adjustment to recognise this change;

when the interest rate has been artificially reduced thanks to the issue of debt with warrants or other products (note that this would nevertheless be restated in IFRS or US GAAP accounts).

Hence, we strongly advise retaining the **market value** of debt rather than its **book value** when the net debt is high and the difference between book and market value is material.

For example, as at 31 December 2020, the book value of Rallye's financial debt was €10,930m, its fair value was only €10,230m, a difference of €700m that represents twice the market capitalisation of Rallye as at mid-2021!

When the company's business is seasonal, year-end working capital may not reflect average requirements, and debt on the balance sheet at the end of the year may not represent real funding needs over the course of the year (see Chapter 11). Some companies also perform year-end "window-dressing" in order to show a very low level of net debt. In these cases, if you notice that interest expense does not correspond to debt balances,[5] you should restate the amount of debt by using a monthly average of outstanding net debt, for example.

Some other items may add complexity in the assessment of the real level of debt. For example, if assets have been removed from the balance sheet thanks to factoring or securitisation, they need to be added back in. In other cases, sellers may try to "dress" the balance sheet to show a level of debt lower than reality.

4/ OTHER VALUATION ELEMENTS

(a) Provisions

Provisions must only be included if cash flows exclude them. If the business plan's EBIT does not reflect future charges for which provisions have been set aside – such as for restructuring, site closures, etc. – then the present value of the corresponding provisions on the balance sheet must be deducted from the value of the company after taxes (if the provision was not tax deductible).

Pension liabilities are a sticky problem (this is developed further in Chapter 7). How to handle them depends on how they were booked and, potentially, on the age pyramid of the company's workforce. You will have to examine the business plan to see whether it takes future pension payments into account and whether or not a large group of employees is to retire just after the end of the explicit forecast period.

> Normally, pension liabilities should be treated as debt. The present value of future outflows for pensions, net of pension assets, should be subtracted from the enterprise value to obtain the equity value.

With rare exceptions, deferred tax liabilities generally remain relatively stable. In practice, they are rarely paid out. Consequently, they are usually not considered debt equivalents.

(b) Unconsolidated or equity-accounted investments

If unconsolidated or equity-accounted financial investments are not reflected in the projected cash flows (via dividends received), you should add their value to the value of discounted cash flows. In this case, use the market value of these assets including, if relevant, tax on capital gains and losses.

For listed securities, use listed market value. Conversely, for minor, unlisted holdings, the book value is often used as a shortcut. However, if the company holds a significant stake in the associated company – this is sometimes the case for holdings booked using the equity method – you will have to value the affiliate separately. This may be a simple exercise, applying, for example, a sector-average P/E to the company's pro rata share of the net income of the affiliate. It can also be more detailed, by valuing the affiliate with a multi-criteria approach if the information is available.

(c) Tax-loss carryforwards

The value of any available tax loss carryforwards can be separately estimated by discounting the tax savings at the cost of capital until they are fully utilised. Alternatively, their use may be simulated in the calculation of free cash flow by using the standard tax rate only for the period following the exhaustion of the tax loss carryforwards.

(d) Minority interests

Future free cash flows calculated on the basis of consolidated financial information will belong partly to the shareholders of the parent company and partly to minority shareholders in subsidiary companies, if any.

This bias can be corrected by deducting minority interests from the enterprise value. If material, they should be valued separately and this can be done by performing a separate valuation of the subsidiaries in which some minority shareholders hold a stake. Naturally, this assumes you have access to detailed information about the subsidiaries.

You can also use a multiple approach. Simplifying to the extreme, you could apply the group's implied P/E multiple to the minority shareholders' portion of net profit to get a first-blush estimate of the value of minority interests. Alternatively, you could apply the group's price-to-book ratio to the minority interests appearing on the balance sheet.

In either case, we would not recommend using book value to value minority interests unless amounts are low.

(e) Dilution

You might be wondering what to do with instruments that give future access to company equity, such as convertible bonds, warrants and stock options. If these instruments have a market value, your best bet will be to subtract that value from the enterprise value of the company to derive the value of equity capital, just as you would for net debt. The number of shares to use in determining the value per share will then be the number of shares currently in circulation.

Alternatively, you could use the treasury stock method (see Section 22.5) to measure the impact of these instruments on the value of the shares. Its drawback lies in ignoring the value of out-of-the money dilutive instruments.

5/ PROS AND CONS OF THE CASH FLOW APPROACH

The advantage of the discounted cash flow approach is that it quantifies the often implicit assumptions and projections of buyers and sellers. It also makes it easier to keep your feet closer to the ground during periods of

market euphoria, excessively high valuations and astronomical multiples. It forces the valuation to be based on the company's real economic performance.

You might be tempted to think this method works only to estimate the value of the majority shareholder's stake and not for estimating the discounted value of a flow of dividends. You might even be tempted to go a step further and apply a **minority discount** to the present value of future cash flows for valuing a minority holding.

This is wrong. Applying a **minority discount** to the discounted cash flow method implies that you think **the majority shareholder is not managing the company fairly**. A discount is justified only if there are “losses in transmission” between free cash flow and dividends. This can be the case if the company's strategy regarding dividends, borrowing and new investment is unsatisfactory.

Similarly, increasing the cash flow-based value can be justified only if the investor believes they can unlock synergies that will increase free cash flows.

To conclude, as satisfying as the DCF method is in theory, it presents three major drawbacks:

It is very sensitive to assumptions and, consequently, the results it generates are very volatile. It is a rational method, but the difficulty in predicting the future brings significant uncertainty.

It sometimes depends too much on the terminal value, in which case the problem is only shifted to a later period. Often the terminal value accounts for more than 50% of the value of the company, compromising the method's validity. However, it is sometimes the only applicable method, such as in the case of a loss-making company for which multiples are inapplicable.

Lastly, it is not always easy to produce projections over a sufficiently long period of time. External analysts may often find they lack critical information.

6/ DISCOUNTING CASH FLOW AND DISCOUNTING DIVIDENDS

Before people grew accustomed to using the discounted free cash flow to firm method,[6] the **dividend discount model** was very popular: the value of a share is equal to the present value of all the cash flows that its owner is entitled to receive, namely the dividends, discounted at the cost of equity (k_E).

This method is not an easy one to carry out if there is a regular change in the financial structure, which prompts a regular change in the cost of equity. But it is widely used to value banks, whose financial structures do not change much over time as a result of the capital adequacy ratios they must respect.[7]

This method is still used in very specific cases – for example, for companies in mature sectors with very good visibility and high payout ratios, such as utilities, concessions and real-estate companies.

Using the same logic, one can compute the value of equity by discounting free cash flow to equity (and no longer to firm) at the cost of equity. Free cash flow to equity is money available for shareholders, i.e. free cash flow to the firm minus after-tax interest payments and plus changes in net debt. We find this method quite theoretical and complex as the cost of equity and therefore the discount rate changes every year with the financial structure.

Section 31.3 MULTIPLE APPROACH OR PEER-GROUP COMPARISONS

1/ PRESENTATION

The peer comparison or multiples approach (or comparables, “comps” method) is based on three fundamental principles:

the company is to be valued in its entirety;

the company is valued at a multiple of its profit-generating capacity. The most commonly used are the P/E ratio, EBITDA and EBIT multiples;

markets are efficient and comparisons are therefore justified.

Much like the DCF model, **the approach is global**, because it is based not on the value of individual operating assets and liabilities per se, but on the overall returns they are expected to generate. The value of the company is derived by applying a certain multiplier to the company's profitability parameters. As we saw in Chapter 22, multiples depend on expected growth, risk and interest rates.

> High expected growth, low risk in the company's sector and low interest rates will all push multiples higher.

The approach is comparative. At a given point in time and in a given country, companies are bought and sold at a specific price level, represented, for example, by an EBIT multiple. These prices are based on internal parameters and by the overall stock market context. Prices paid for companies acquired in Europe in 2021, for example, when EBIT multiples were high (15 times on average) were not the same as for those acquired in 1980 when multiples hovered around four times EBIT.

Multiples can derive from a sample of comparable, listed companies or a sample of companies that have recently been sold. The latter sample has the virtue of representing actual transaction prices for the equity value of a company. These multiples are respectively called **market multiples or trading multiples** and **transaction multiples**. **The first ones will be used to value shares of a firm that will not change control (for portfolio**

management or in the context of an IPO). The second ones are useful for assessing the value of equity in the context of change of control.

2/ BUILDING A SAMPLE OF COMPARABLE COMPANIES

For market multiples, a peer group comparison consists of setting up a sample of comparable listed companies that have not only similar sector and ideally geographic characteristics, but also similar operating characteristics, such as expected growth rates, size, etc. You should choose companies whose shares are liquid and are covered by a sufficient number of financial analysts.

3/ THE MENU OF MULTIPLES

There are two major groups of multiples: those based on the enterprise value (i.e. the value of capital employed), which is then used to obtain the value of equity, and those which are based directly on the value of equity.

Multiples based on the value of capital employed are multiples of operating balances before subtracting interest expense: EBIT and EBITDA multiples.

Multiples based on the value of equity are multiples of operating balances after interest expense, principally net income (P/E multiple), as well as multiples of cash flow and multiples of underlying income – i.e. before non-recurring items and the price book multiple (PBR).

(a) Multiples based on enterprise value

Whatever multiple you choose, you will have to value the capital employed for each listed company in the sample. This value is the sum of the company's market capitalisation (or transaction value of equity for transaction multiples) and the value of its net debt at the valuation date and other adjustments presented.

In any case you need to be clear: the value of a minority stake will be deducted from the enterprise value if no dividend has been included in the company parameter (EBIT or EBITDA, which is normally the case), but not if it is included (net income). If pension assets minus pension liabilities have been added to enterprise value, then the part of pension cost corresponding to the interest cost shall not be included in the EBIT or EBITDA,[8] etc.

You will then calculate the multiple for the comparable companies over three fiscal years: the current year, last year and next year. Note that we use the same value of capital employed in all three cases, as current market values should reflect anticipated changes in future operating results.[9]

Once the multiples of the comparable companies have been calculated and applied to the corresponding aggregates of the company to be valued, the value of the net debt and similar items presented on page 563 should be deducted from the value of the enterprise value arrived at in this way. The only case where the net debt included in these two valuation methods could be different is the subject of question 19 at the end of this chapter.

EBIT multiple

The EBIT multiple is the ratio of the enterprise value to EBIT (operating income). It takes into account the genuine profit-generating capacity of the sample companies.

> A company's genuine profit-generating capacity is the normalised operating profitability it can generate year after year, excluding exceptional gains and losses and other non-recurring items.

You may have to perform some restatements in order to derive this operating income.

Consider the following sample of listed companies comparable to ArcelorMittal:

€m	ThyssenKrupp	Voestalpine	Salzgitter	Nippon Steel	US Steel
Market capitalisation (value of equity)	6,000	6,580	1,600	14,552	5,715
+ Value of debt	–3,782	3,281	879	17,135	2,565

€m	ThyssenKrupp	Voestalpine	Salzgitter	Nippon Steel	US Steel
= Value of capital employed (*A*)	2,218	9,087	2,479	31,687	8,280
2021e Operating income (EBIT) (*B*)	424	782	366	4,104	1,848
2021e EBIT multiple (*A*/*B*)	5.2 x	11.6 x	6.8 x	7.7 x	4.5 x

The 2021 average pre-tax operating income (EBIT) multiple is 7.2 times. Applied to ArcelorMittal's 2021e operating income of $5,564m, comparable multiples would value ArcelorMittal's enterprise value at $40,584m and equity at $26,584m, taking into account $14,000m of debts.

EBITDA multiple

The EBITDA multiple follows the same logic as the EBIT multiple. It has the merit of eliminating the sometimes significant differences in depreciation methods and periods. It is very frequently used by stock market analysts for companies in capital-intensive industries which therefore record significant depreciation and amortisation charges.

Be careful when using the EBITDA multiple, however, especially when the sample and the company to be valued have widely disparate levels of margins. In these cases, the EBITDA multiple tends to overvalue companies with low margins and undervalue companies with high margins, independently of depreciation policy. Let's take the following example:

	Group A	Group B
Sales	100	100
EBITDA	20	11
Depreciation	10	10

	Group A	Group B
EBIT	10	1
Enterprise value	140	?

Group A is valued at seven times its EBITDA. If we use this same multiple to value Group B, we derive an enterprise value for Group B of 77 (11 × 7). But if the cost structure of Group B remains the same in the future, its EBIT will always be close to 0; if that is the case, an investor would have difficulties paying a lot for such a company. The value of such a firm should be close to nil. This is the result we find if we prefer the EBIT multiple to the EBITDA multiple.

Other multiples

Operating multiples can also be calculated on the basis of other measures, such as turnover. Some industries have even more specific multiples, such as multiples of the number of subscribers, number of visitors or page views for Internet companies, tons of cement produced, etc. These multiples are particularly interesting when the return on capital employed of the companies in the sample is standard. Otherwise, results will be too widely dispersed. They are only meaningful for small businesses such as shops, where there are a lot of transactions and where, in many countries, turnover gives a better view of the profitability than the official profit figure.

These multiples are generally used to value companies that are not yet profitable: they were widely used during the Internet bubble, for instance. They tend to ascribe far too much value to the company to be valued, and we recommend that you avoid them.

(b) Multiples based on equity value

You may also decide to choose multiples based on operating balances after interest expense. These multiples include the P/E ratio, the cash flow multiple and the price-to-book ratio. All these multiples use market capitalisation at the valuation date (or price paid for the equity for transaction multiples) as their numerator. The denominators are net profit, cash flow and book equity, respectively. The net profit used by analysts is the company's bottom line, i.e. the net profit attributable to the group (after deduction of minority interests) restated to exclude non-recurring items and

the depreciation of goodwill, so as to put the emphasis on recurrent profit-generating capacity.

Using the same sample of comparable comparisons for ArcelorMittal presented before, we notice that the P/E ratio in 2021 for companies comparable to ArcelorMittal is 7.6:

€m	ThyssenKrupp	Voestalpine	Salzgitter	Nippon Steel	US Steel
Market capitalisation (*A*)	6,000	6,580	1,600	14,552	5,715
2017e Net income (*B*)	–278	528	241	1,820	1,652
P/E ratio (*A*)/(*B*)	n.m.	12.5 x	6.6 x	8.0 x	3.5 x

Applied to ArcelorMittal's 2021e net income prediction of €3,790m, comparable multiples would value ArcelorMittal's equity at €28,952m.

These multiples indirectly value the company's financial structure, thus creating distortions depending on whether or not the companies in the sample are indebted.

Consider the following two similarly sized companies, Ann and Valeria, operating in the same sector and enjoying the same outlook for the future, with the following characteristics:

	Company	Ann	Valeria
	Operating income (EBIT)	129	177
−	Interest expense	9	120
−	Corporate income tax (30%)	36	17
=	Net profit	84	40
	Value of equity	2,100	?
	Value of debt (at 3% and 10% p.a. respectively)	300	1,200

Ann's P/E ratio is 25 (2,100 / 84). As the two companies are comparable, we might be tempted to apply Ann's P/E ratio to Valeria's bottom line to obtain Valeria's value of equity – i.e. 25 × 40 = 1,000.

Although it looks logical, this reasoning is flawed. Applying a P/E ratio of 25 to Valeria's net income is tantamount to applying a P/E of 25 to Valeria's NOPAT (177 × (1 – 30%) = 124) less a P/E of 25 applied to its after-tax interest expense (120 × (1 – 30%) = 84). After all, net income is equal to net operating profit after tax less interest expense after tax.

The first term (25 × NOPAT) should represent the enterprise value of Valeria, i.e. 25 × 124 = 3,100.

The second term (25 × after-tax interest expense) should thus represent the value of debt to be subtracted from enterprise value to give the value of equity capital that we are seeking. However, 25 × interest expense after tax is 2,100, whereas the value of the debt is only 1,200.

In this case, this type of reasoning would result in overstating the value of the debt (at 2,100 instead of 1,200) and then understating the value of the company's equity.

The proper reasoning is as follows: we first use the multiple of Ann's EBIT to get Valeria's enterprise value. If Ann's equity value is 2,100 and its debt is worth 300, then its enterprise value is 2,100 + 300, or 2,400. As Ann's EBIT is 129, the multiple of Ann's EBIT is 2,400 / 129 = 18.6. Valeria's enterprise value is therefore equal to 18.6 times its EBIT, or 18.6 × 177 = 3,293. We now subtract the value of the debt (1,200) to obtain the value of equity capital, or 2,093. This is not the same as 1,000!

These distortions are the reason why financial analysts mostly use multiples of operating income (EBIT) or of operating income before depreciation and amortisation (EBITDA). This approach removes the bias introduced by different financial structures.

4/ TRANSACTION MULTIPLES

The approach is slightly different, but the method of calculation is the same. The sample is composed of information available on recent transactions in the same sector, such as the sale of a controlling block of shares, a merger, etc.

If we use the price paid by the acquirer, our multiple will contain the **control premium** the acquirer paid to obtain control of the target company. As such, the price includes the value of anticipated synergies. Using the listed share

prices leads to a so-called minority value, which we now know is nothing other than the standalone value. In contrast, transaction multiples reflect majority value – i.e. the value including any control premium for synergies. For listed companies it has been empirically observed that control premiums are around 25% to 30% of pre-bid market prices (i.e. prices prior to the announcement of the tender offer).

You will find that it is often difficult to apply this method, because good information on truly comparable transactions is often lacking or incomplete (price paid not made public, unknown aggregates when the company is private, etc.).

As an example, the EBITDA multiples used in Europe for medium-sized company transfers are given in Section 31.6.

5/ MEDIANS, MEANS AND REGRESSIONS

People often ask if they should value a company by multiplying its profit-generating capacity by the mean or the median of the multiples of the sample of comparable companies. Our advice is to be wary of both means and medians, as they can mask wide disparities within the sample, and sometimes may contain extreme situations that should be excluded altogether. Try to understand why the differences exist in the first place rather than burying them in a mean or median value that has little real significance. For example, look at the multiples of the companies in the sample as a function of their expected growth. Sometimes this can be a very useful tool in positioning the company to be valued in the context of the sample.

Some analysts perform linear regressions to find a relationship between, for example, the EBIT multiple and expected growth in EBIT, the multiple of turnover and the operating margin, and the price-to-book ratio and the return on equity (to value banks).

This method allows us to position the company to be valued within the sample. The issue remaining, then, is to find the most relevant criterion. R^2 indicates the significance of the regression line, and will be our guide in determining which criteria are the most relevant in the industry in question. Sometimes it allows you to choose a multiple outside the range of

comparables' multiples, simply because the company you are valuing has higher or lower expected growth than others you are comparing it with.

Section 31.4 THE SUM-OF-THE-PARTS METHOD (SOTP) OR NET ASSET VALUE (NAV)

The sum-of-the-parts method consists in valuing and summing up the company's different assets, divisions or subsidiaries and deducting liabilities. It is a method well suited for holding companies, diversified groups or conglomerates, for which consolidated accounts projections give too global a view.

The sum-of-the-parts method is simple. It consists in systematically studying the value of each asset and each liability on the company's balance sheet. For a variety of reasons – accounting, tax, historical – book values are often far from reality. They must therefore be restated and revalued before they can be assumed to reflect a true net asset value. The sum-of-the-parts method is an **additive method**. Revalued assets are summed, and the total of revalued liabilities is subtracted.

For diversified groups, the SOTP or NAV method implies valuing subsidiaries or activities pro rata the ownership level using either the DCF or the multiples of comparable companies method. Then, the debt of the mother company[10] is deducted as well as the present value of central costs. For example, UBS issued the following valuation in mid-2019 for Vivendi, a media group:

	Value	Valuation method
Universal Music Group (80%)	30,884	Recent transaction
Canal+ (89%)	4,896	2022 EBITDA multiple
Havas	2,209	2022 EBITDA multiple
Editis	663	2022 EBITDA multiple
Gameloft	813	Sales multiple
Vivendi Village	47	Sales multiple
Holding company and others	–1,423	Cost multiple
Total enterprise value	**38,089**	

	Value	Valuation method
+ Listed minority holdings	3,513	
incl. Telecom Italia (23.87%)	*1,594*	Stock market price
incl. Mediaset (28.8%)	*804*	Stock market price
inc. Lagardere (28.3%)	*835*	Stock market price
inc. Other (Prisa, Multichoice)	*279*	Stock market price
Non Listed minority holdings	1,237	
– Adjusted net debt (2021 Y/E)	–3,402	
Equity value	**39,437**	

To apply this method properly, therefore, we must value each asset and each liability. Estimates must be consistent, even though the methods applied might be different.

Several basic types of value are used in the sum-of-the-parts method:

market value: this is the value we could obtain by selling the asset. This value might seem indisputable from a theoretical point of view, but it virtually assumes that the buyer's goal is liquidation. This is rarely the case. Acquisitions are usually motivated by the promise of industrial or commercial synergies;

value in use: this is the value of an asset that is used in the company's operations. It is a kind of market value at replacement cost;

liquidation value: this is the value of an asset during a fire sale to get cash as soon as possible to avoid bankruptcy. It is market value minus a discount.

The sum-of-the-parts method is the easiest to use and the values it generates are the least questionable when the assets have a value on a market that is **independent of the company's operations**, such as the property market, the market for aeroplanes, etc. It is hard to put a figure on a new factory in a new industrial estate. However, the value of the inventories and vineyards of a wine company is easy to determine and relatively undisputed, since a secondary market exists for these assets.

1/ TANGIBLE ASSETS

Tangible assets can be evaluated on the basis of replacement value, liquidation value, going-concern value or yet other values.

We do not intend to go into great detail here. Our main point is that in the sum-of-the-parts method it is important to determine an overall value for productive and commercial assets. Rather than trying to decompose assets into small units, you should reason on a general basis and consider sufficiently large groups of assets that have a standalone value (i.e. for which a market exists or that can operate on a standalone basis).

For example, it makes no sense to value the land on which a warehouse has been built. It makes more sense to value the combination of the land and the buildings on it. An appraiser will value the combination based on its potential productive capacity, not on the basis of its individual components. Of course, this is not the case if the objective is to reuse the land for something else, in which case you will want to deduct the cost of knocking down the warehouse.

2/ INVENTORIES

For industrial companies, valuing inventories usually does not pose a major problem, unless they contain products that are obsolete or in poor condition. In this case, we have to apply a discount to their book value, based on a routine inventory of the products.

In some situations, you will have to revalue the inventories of companies with long production cycles; the revaluation can lead to gains on inventories. This is often the case with champagne and cognac or even losses on completion not yet booked. The revaluations need to include their corporate income tax impact. In revaluing inventories, you must be aware that we are already buying the profits of the next few years.

3/ INTANGIBLE ASSETS

It might seem paradoxical to value intangible assets, since their liquidation value has, for a long time, been considered to be low. It is now widely acknowledged, however, that the value of a company is partly determined by the real value of its intangible assets, be they brand names, a geographical location or other advantages.

> The sum-of-the-parts approach makes no sense unless it takes into account the company's intangible assets.

Some noteworthy examples:

Brands: particularly hard to value but the importance of brands in valuation is growing.

In general, there are three methods for valuing brands:

Method 1 The first method asks how much would have to be spent in advertising expense, after tax, to rebuild the brand. This method leads to undervaluation of new and successful brands (Netflix) and overvaluation of older and failing brands (the Amazon Fire phone).

Method 2 The second method calculates the present value of all royalty payments that will or could be received from the use of the brand by a third party. It is very sensitive to the chosen royalty rate.

Method 3 The third method consists in analysing the brand's fundamental utility. After all, the brand's *raison d'être* is to enable the company to sell more and at higher prices than would otherwise be possible without the brand name (costs of enhanced quality and services, of communication). Discounting this “excess profit” over a certain period of time should, after subtracting the related higher costs, yield an estimate of the value of the brand. Users of this method discount the incremental future operating income expected from the use of the brand and subtract the additional operating expense, working capital and investments, thereby isolating the value of the brand. We will not hide the fact that this approach, while intellectually appealing, is very difficult to apply in practice, because often there is no generic “control” product to use as a benchmark.

Patents and technical know-how: they are valued as brands, but with the same difficulties.

Lease rights: the present value of the difference between market rental rates and the rent paid by the company.

4/ TAX IMPLICATIONS

The acquirer's objectives will influence the way taxes are included (or not) in the sum-of-the-parts approach.

If the objective is to liquidate or break up the target company into component parts, then the acquirer will buy the assets directly, giving rise to capital gains or losses. The taxes (or tax credits) theoretically generated will then decrease (increase) the ultimate value of the asset.

If the objective is to acquire some assets (and liabilities), and to run them as a going concern, then the assets will be revalued through the transaction. Increased depreciation will then lower income tax compared to liquidation or the breakup case above.[11]

If the objective is to acquire a company and maintain it as a going concern (i.e. not discontinue its activities) and as a separate entity, then the acquiring company buys the shares of the target company rather than the underlying assets. It cannot revalue the assets on its books and will depreciate them from a lower base than if it had acquired the assets directly. As a result, depreciation expense will be lower and taxes higher.

5/ USEFULNESS OF SUM-OF-THE-PARTS VALUES

Sum-of-the-parts values can be deceptive, as many people think they imply safe or reliable values. In fact, when we say that a company has a high net asset value, it means that from a free cash flow point of view, the company's terminal value is high compared with the value of intermediate cash flows. Consequently, the more “net asset value” a company has and the fewer cash flows it has, the more speculative and volatile its value is. Granted, its industrial risk may be lower, but most of the value derives from speculation about resale prices.

For this reason, the sum-of-the-parts method is useful for valuing small companies with no particular strategic value, or companies whose assets can be sold readily on a secondary market (aeroplanes, cinemas, etc.).

Section 31.5 COMPARISON OF VALUATION METHODS

1/ RECONCILING THE DIFFERENT METHODS OF VALUATION

If markets are efficient, then all of the valuation methods discussed so far should lead to the same valuation. In reality, however, there are often differences among the sum-of-the-parts value, the DCF-based value and the peer-comparison value. You must analyse the source of these differences and **resist the temptation to average them**!

(a) Analysing the difference between sum-of-the-parts value and discounted cash flow value

If the sum-of-the-parts value is higher than the DCF value or the value derived from a comparison of multiples (both return based values), then the company is being valued more for its past, its revalued equity capital, than for its outlook for future profitability. In this case, the company should not invest but divest, liquidating its assets to boost profitability and improve the allocation of its resources. This is often the punishment for overly complacent management.

This strategy occurs at regular intervals (in the 1980s, in 2007–2008). Companies were bought up on the open market, and then sold off piecemeal. The buyer realises a gain because the parts are worth more than the company as a whole. Alternatively, often under pressure from activist investors (Chapter 41), the company can of its own volition embark on this refocusing process (General Electric, ThyssenKrupp, Seimens).

If the sum-of-the-parts value is lower than the DCF value or the value derived from multiples, which is the usual case in an economy where companies have a lot of intangibles, then the company is very profitable and invests in projects with expected profitability greater than their cost of capital. The company has real expertise, strong strategic positioning and enjoys high barriers to entry. But the chances are that it will not escape competitive pressure forever.

Goodwill value has long been used to correct the restated net asset value to take into account the anticipated return on capital employed of the firm compared to its cost of capital and hence to value its “intangible capital”.

The starting point of all these mixed methods was to determine the capital employed, restated for potential capital gains or losses. Then a normative operating profit was computed by applying the cost of capital to the capital employed. The difference between the actual operating profit and the normative operating profit was called super-profit (leading to goodwill if positive and badwill if negative). The super-profit is to be discounted over a certain period to derive the value of goodwill. This is conceptually close to the EVA.

(b) Comparison values versus DCF values

If the value obtained via peer comparison is greater than the DCF-based value (and if all the calculations are correct!), then the company's managers should be thinking about floating the company on the stock exchange, because financial investors have a more positive view of the company's risk profile and profitability outlook than its management or current shareholders. Conversely, if the value obtained by comparison is lower than the DCF value and if the business plan is reliable, it would be wiser to wait until more of the long-term growth potential in the company's business plan feeds through to its financial statements before launching an IPO; and perhaps do a public-to-private (see Section 47.2, 2/) if the company is already listed.

If transaction multiples generate a significantly higher value than market multiples or the DCF model, then it would be better to organise a trade sale by soliciting bids from several industry participants. In short, look before you leap!

(c) Is there one valuation method for selling a company and another for buying it?

There is no technical reason why a seller should not use one valuation method and the buyer another:

A seller usually favours the DCF method as it is based upon a business plan which is rarely built on pessimistic assumptions! Most business plans are established by the management under instruction from selling shareholders. But in the back of their mind, a seller will not forget results obtained with a peer-comparison method, as they will be very reluctant to sell at a lower multiple than the one obtained by a competitor a few months ago or the one they could get through an IPO.

A buyer will use the peer-comparison method to justify a lower price than that resulting from the DCF. They will claim that other buyers have paid 100 and there is no reason why they should pay 120 or 130. Nevertheless, at the back of their mind the buyer is thinking about their own business plan, including synergies and new developments. They will soon be able to compute their own DCF to check whether the price they will pay is expected to create value for their own shareholders.

2/ THE LIFECYCLE THEORY OF COMPANY VALUE

Companies that have achieved a certain level of success will see their sum-of-the-parts and cash flow values differ throughout their lifecycle. Lifecycle is an important factor in determining the value of companies, as it was in determining the optimal capital structure and financing policies.

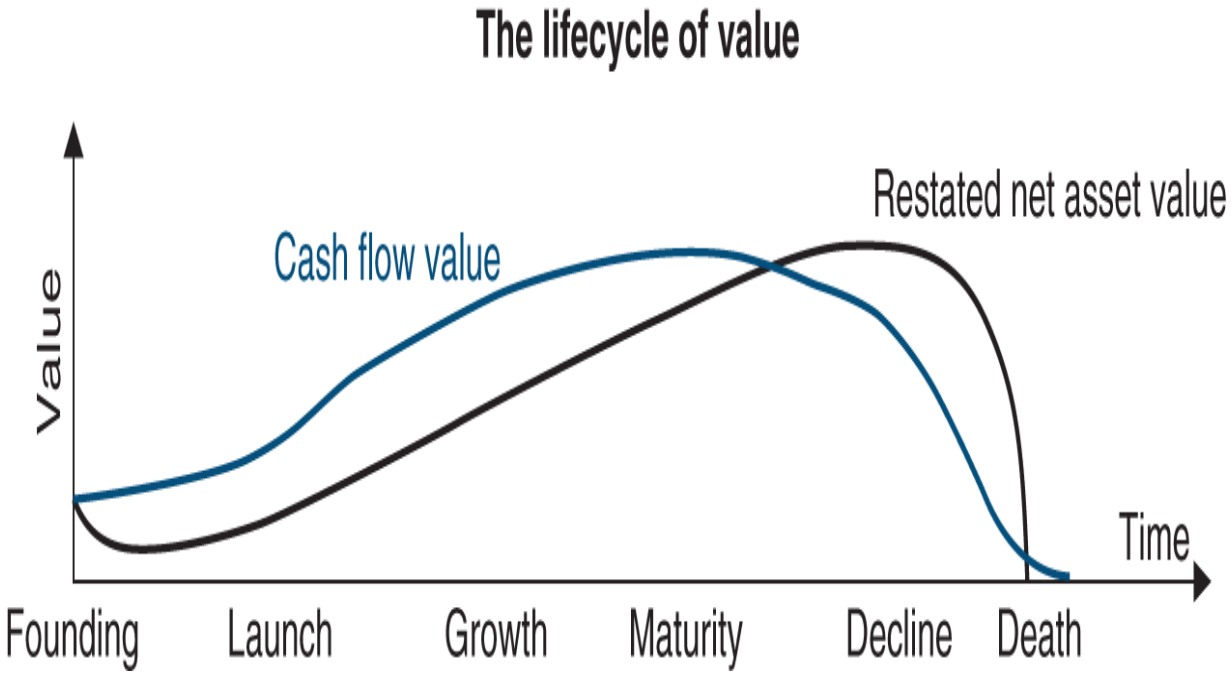
When the company is founded, its net asset value and cash flow value are identical; the company has not yet made any investments. After the first year or two of operations, net asset value may dip because of start-up losses. Meanwhile, cash flow value is greater because it anticipates hopefully positive future profitability.

During the growth phase, net asset value will rise as all or part of the company's profits are reinvested and the company builds a customer base (the value of which does not appear in the accounts, however). Cash flow value also continues to rise and remains above the net asset value. The company's expertise has not yet become a tangible asset. It is still associated with the people who developed it.

At maturity, cash flow value will start growing more slowly or stop growing altogether, reflecting a normal profit trend. Nonetheless, the net asset value continues to grow, but more slowly because the company increases its

payout ratio. Broadly speaking, net asset value and cash flow value are very close.

If the company then enters a phase of decline, its profits decline and the cash flow value slips below net asset value. The latter continues to grow but only very slowly, until the company starts posting losses. The net asset value falls. As for cash flow value, it drops very low. **The net asset value then becomes particularly speculative.**



Net asset value and cash flow value evolve differently throughout the life of the company.

At any given point in time, it is very important to understand the reasons for the difference between the net asset value and the cash flow value, because this understanding gives important clues as to the situation and future prospects of the company.

You might now be thinking that our kaleidoscope of methods leads to as many **values** as there are images of the company:

sum-of-the-parts, or net asset value;

peer-comparison value;

intrinsic value (i.e. DCF), etc.

We advise against calculating a wide variety of valuations, unless it is to show that you can prove anything when it comes to valuation. But you must not throw up your hands in despair either. Instead, try to understand each type of value, which corporate circumstances it applies to and what its implicit assumptions are. It is more important to determine ranges than to come up with precise values. Precision is the domain of negotiation, the goal of which is to arrive at an agreed **price**.

Lastly, remember that valuing a company means:

taking a speculative stance not only on the future of the company, but also on its market conditions. The cash flow and comparison methods demonstrate this;

implicitly extrapolating past results or expected near-term results far into the future, opening the door to exaggeration;

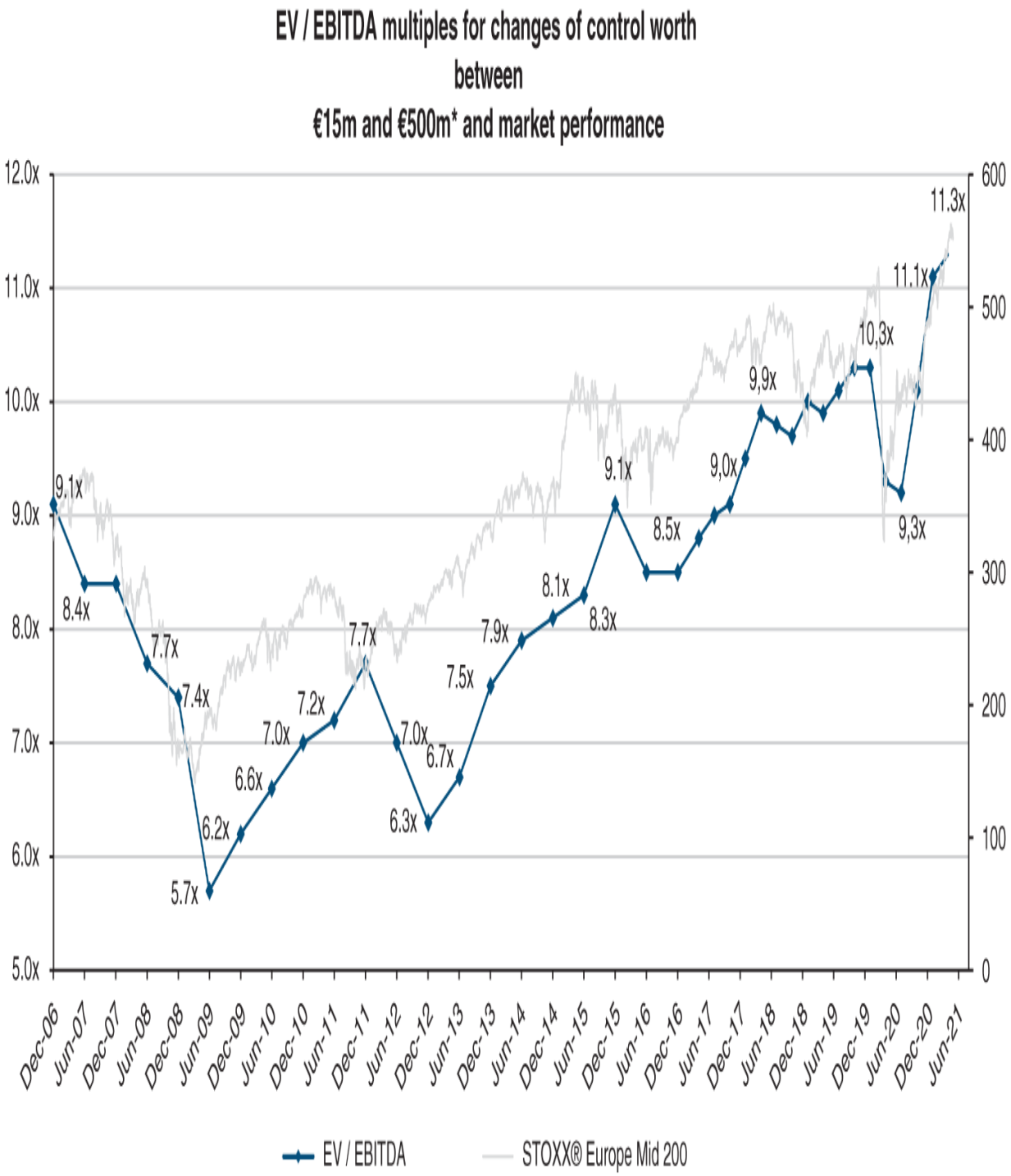
sometimes forgetting that net asset value is not a good reference if the profitability of the company differs significantly from its investors' required return.

Shareholders' decisions to sell all or part of a company are based on the price they believe they can obtain compared to their set of calculated valuations.

Section 31.6 PREMIUMS AND DISCOUNTS

A newcomer to finance might think that the market for the purchase and sale of companies is a separate market with its own rules, its own equilibria, its own valuation methods and its own participants.

This is absolutely wrong. Indeed, the market for corporate control is simply a segment of the financial market. The valuation methods used in this segment are based on the same principles as those used to measure the value of a financial instrument. Experience has proven that the higher the stock market, the higher the price of unlisted companies, as the following graphic illustrates:



*€15m to €150m until June 2013

Source: Argos Wityu and Facset

Participants in the market for corporate control think the same way as investors in the financial market. Of course, the smaller the company is, the

more tenuous is the link. The value of a butcher's shop or a bakery is largely intangible and hard to measure, and thus has little in common with financial market values. But in reality, only appearances make the market for corporate control seem fundamentally different.

1/ STRATEGIC VALUE AND CONTROL PREMIUM

There is no real control value other than strategic value, which we will develop later. Gone are the days when the control premium was reserved for the majority shareholder and minority shareholders were deprived of it. Stock markets have established equal treatment of shareholders as an absolute principle: minority shareholders are entitled to the same transfer price as the majority shareholder receives for their controlling stake.

Shareholder agreements are a common method for expressing this principle in unlisted companies.

> When control of a listed company changes hands, minority shareholders receive the same premium as that paid to the majority shareholder (we recognise that the relation may be more complex for start-ups, as we explain in Chapter 40).

Nevertheless, entrepreneursoften have a diametrically opposed view. For them, minority shareholders are passive beneficiaries of the fruits of all the personal energy the managers/majority shareholders have invested in the company. It is difficult to convince entrepreneurs that the roles of management and shareholders can be separated and that they must be compensated differently – and especially that the risk assumed by all types of shareholders must be rewarded.

If we assume that markets are efficient, then the existence of such a premium can be justified only if the new owners of the company obtain more value from it than its previous owners did. A control premium derives from the **industrial, commercial, administrative or tax synergies** the new majority shareholders hope to unlock. They hope to improve the acquired company's results by managing it better, pooling resources, combining businesses or taking advantage of economies of scale. These value-creating actions are reflected in the buyer's valuation. The trade buyer (i.e. an

acquirer who already has industrial operations) wants to acquire the company so as to change the way it is run and, in doing so, create value.

The company is therefore worth more to a trade buyer than it is to a financial buyer, who values the company on a **standalone** basis, as one investment opportunity among others, **independently of these synergies**.

In this light, we now understand that the trade buyer's expectations are not the same as those of the financial investor. This difference can lead to a different valuation of the company. We call this **strategic value**.

Strategic value is the maximum value a trade buyer is prepared to pay for a company. It includes the value of projected free cash flows of the target on a standalone basis, plus the value of synergies from combining the company's businesses with those of the trade buyer. It also includes the value of expected improvement in the company's profitability compared to the business plan provided, if any.

We previously demonstrated that the value of a financial security is independent of the portfolio to which it belongs, but now we are confronted with an exception. Depending on whether a company belongs to one group of companies or another, it does not have the same value. Make sure you understand why this is the case. The difference in value derives from different cash flow projections, not from a difference in the discount rate applied to them, which is a characteristic of the company and identical for all investors. **The principles of value are the same for everyone, but strategic value is different for each trade buyer, because each of them places a different value on the synergies they believe it can unlock and on their ability to manage the business better than current management.**

> For this reason, a company's strategic value is theoretically always higher than its standalone value.

As the seller will also hope to benefit from the synergies, negotiation will focus on how the additional profitability the synergies are expected to generate will be shared between the buyer and the seller.

But some industrial groups go overboard, buying companies at twice their standalone value on the pretext that their strategic value is high or that

establishing a presence in such-and-such geographic location is crucial. They are in for a rude awakening. Sometimes the market has already put a high price tag on the target company. Specifically, when the market anticipates merger synergies, speculation can drive the share price far above the company's strategic value, even if all synergies are realised. In other cases, a well-managed company may benefit little or even be hurt by teaming up with another company in the same industry, meaning either that there are no synergies to begin with or, worse, that they are negative, or that the absorption of the company into a much larger group demotivates its managers.

2/ NEGATIVE CONTROL VALUE

Groups can sometimes sell, at a negative price, subsidiaries that are heavily loss-making and that they are unable to turn around. That is, they pay a buyer a sum of money, so that the buyer agrees to buy the shares of that subsidiary from them for a symbolic euro. Thus, in these atypical cases, there is a negative control premium! Materially, the group subscribes to a capital increase of its subsidiary until it reduces its net indebtedness to the negative price agreed with the buyer. Then the transfer of control takes place for one euro.

As the transfer price represents one to three years of losses, from the seller's point of view they have concluded a good financial transaction. Indeed, at a constant loss, the seller recovers their final investment in one to three years, which is a very short payback period. They do not have to carry out a major restructuring or liquidation, which would be damaging to their reputation, especially if they are successful in other sectors.

Following the acquisition for one euro, the buyer will find a net cash position that will enable them to finance part of the company's recovery.

This negative price scenario obviously does not concern listed companies. Thus, in 2021 Saint Gobain sold Lapeyre, which was highly loss-making, to the German turnaround fund Mutares for a negative price of €243m, i.e. 3 times 2020 losses.

3/ MINORITY DISCOUNTS AND PREMIUMS

We have often seen minority holdings valued with a discount, and you will quickly understand why we believe this is unjustified. A “minority discount” would imply that minority shareholders have proportionally less of a claim on the cash flows generated by the company than the majority shareholder. This is not true.

> Whereas a control premium can (and must) be justified by subsequent synergies, there is no basis for a minority discount.

In fact, a shareholder who already has the majority of a company's shares may be forced to pay a premium to buy the shares held by minority shareholders. On average, in Europe, the premium paid to buy out minorities is in the region of 10 to 20% (but the premium can be significantly higher for low liquidity listed companies), less than that paid to obtain control. Indeed, majority shareholders may be willing to pay such a premium if they need full control over the acquired company to implement certain synergies.

Having said that, the lack of liquidity associated with certain minority holdings, either because the company is not listed or because trading volumes are low compared with the size of the minority stake, can justify a discount. In this case, the discount does not really derive from the minority stake per se, but from its lack of liquidity. A minority shareholder, aware of the value of the shareholding it holds, will only be able to sell it if the majority shareholder also decides to sell.

Lack of liquidity may increase the volatility of the share price. Therefore, investors will discount an illiquid investment at a higher rate than a liquid one. The difference in values results in a liquidity discount.

We have encountered some cases where the liquidity discount exceeded 50% for a minority shareholder that wanted to sell its shares, which the majority shareholder only offered to buy after three years of discouraging all potential acquirers. But we have also seen the lack of discount when the disposal of a small stake could change the balance of power in a company.

This is similar to the situation of a listed company with a reduced free float, where the minority shareholder is then in the hands of the majority shareholder who controls the market communication of the firm. Some listed firms can suffer from an undervaluation due to reduced liquidity of the

share, so analysts do not publish research and it then becomes a vicious circle.

In a listed company of sufficient size with widely spread capital, the situation is different as the minority shareholder will be protected by the relevant share price and the protection afforded by market authorities.

> The only reliable assessment of liquidity discount is provided by the IPO discount that the seller may have to suffer in the case of listing of a company. But the urgency of the disposal and the bargaining power between seller and buyer may alter this level significantly.

SUMMARY

The summary of this chapter can be downloaded from www.vernimmen.com.

Discounted cash flow is based on the notion that the value of the company is equal to the amount of free cash flows expected to be generated by the company in the future and discounted at a rate commensurate with its risk profile. The discount rate applied is the weighted average cost of capital (WACC). The DCF calculation is performed as follows:

future free cash flows are discounted over the explicit forecast period, i.e. the period over which there is visibility on the company's operations;

a terminal value is calculated on the basis of an estimated growth rate carried to perpetuity, which must then be discounted;

the value of equity is the difference between the enterprise value obtained above and the value of the company's net debt.

The peer group or multiples method is a comparative approach that sets off the company to be valued against other companies in the same sector. In this approach, the enterprise value of the company is estimated via a multiple of its profit-generating capacity before interest expense. EBIT and EBITDA multiples are among those commonly used. The multiple used in the comparison can be either a market multiple or a transaction multiple. The value of net debt is deducted from this enterprise value to get the value of equity. Equity can also be directly valued through a multiple of net income, cash flow or book equity.

The sum-of-the-parts method of valuation consists in valuing and summing up each of the company's assets, subsidiaries or divisions and subtracting liabilities. There are several types of net asset value, from liquidation value to going-concern value, and there are important tax considerations. Either capital gains or losses will be subject to tax or depreciable assets will be undervalued and yearly taxes higher. Calculating net asset value makes sense only if it includes the company's intangible assets, which can be particularly difficult to value.

No company valuation is complete without an analysis of the reasons for the differences in the results obtained by the various valuation methods.

These differences give rise to decisions of financial engineering and evolve throughout the life of the company.

To the financial manager, the market for corporate control is nothing but a segment of the broader capital market. From this principle it follows that there is no such thing as control value, other than the strategic value deriving from synergies.

Industrial synergies generally make a company's strategic value higher than its financial or standalone value. The essence of negotiation lies in determining how the strategic value pie will be divided between the buyer and the seller.

QUESTIONS

1/What is the most relevant cash flow when valuing a company using the discounted cash flow method?

2/What sort of a discount can a minority shareholder get compared with financial value? Does the situation differ between a listed company and an unlisted company?

3/What is a synergy?

4/Can you multiply a P/E ratio by the EBIT to get the equity value?

5/Describe the type of company that has a financial value higher than its strategic value.

6/Which method in your view would be best suited for valuing: a property management company; a holding company; a mutual fund; a company in the aeronautics sector; a bicycle factory; a portfolio of movies?

7/Can an asset have several values? Why?

8/Is a valuation of a cinema theatre or a chemist shop in terms of a number of weeks' sales a result of the sum-of-the-parts or the cash flow method?

9/What are the two determining factors when valuing a wine estate?

10/Which method should be used for estimating the value of a company in decline?

11/When a company is bought, is there a control premium? Why?

12/Name the types of companies for which cash flow value is much higher than net asset value.

13/Can the purchase of a company by financial investors create value? And by trade buyers?

14/Has a reduction in working capital of 1% the same impact on a DCF as a 1% improvement in the NOPAT (Net Operating Profit After Tax) margin?

15/Why can we say that the mean or the median figure is the choice of an indecisive person?

16/What is the popular saying on which the cash flow fade method is founded?

17/Should the buyer's costs be separated from the target company's costs in the cost savings that come out of a merger of two companies?

18/Which lesson can you derive from the graph in this chapter showing EV/EBITDA of acquisitions and market prices?

19/Show that in the event of an exceptional and temporary change in working capital that would inflate net debt just prior to the cash flow discounting period, the value of net debt taken into account in the DCF method will differ from that used in the multiple method.

You'll find more questions at www.vernimmen.com.

EXERCISES

1/Megabyte plc is a high-tech company experiencing transitional problems. To get through this difficult period, management has decided on a €120m recapitalisation. In five years' time, the company should make net profits of €21m, and be valued at 30 times its profits. Assume that the discount rate is 25% and that there will be no cash flows generated for five years.

What is the present value of shareholders' equity?

What is the present value of shareholders' equity if profits of only €14m are expected in five years?

What do you conclude from the above?

The table below shows the forecasts for Management plc (in millions of €):

Year	**1**	**2**	**3**	**4**	**5**
Sales	3,960	4,080	4,200	4,326	4,458
Cost of goods sold	1,782	1,794	1,806	1,860	1,917
Marketing costs	870	897	924	996	1,026
Administrative costs	396	408	420	432	447
Depreciation and amortisation	330	315	300	300	300
EBIT (operating income)	582	666	750	738	768

The company is expecting annual capital expenditure of €300m per year over the next five years; working capital will increase by €50m in years 1 and 2, and stabilise thereafter. The following information is also available:

the company has net debts today of €2,250m;

the company's cost of equity is estimated at 10%, and the cost of debt at 6% (before tax);

financing is split 2/3 equity and 1/3 debt;

the tax rate is 37%;

an increase in inflows of 2% to perpetuity can be expected from year 6.

Work out the value of Management plc using the DCF method.

3/The mean multiple for the 2021 operating profits of comparable peers is 10, and the mean 2021 P/E is 15. Calculate the equity value of Pixi Spa. Key figures for the company are set out below:

	Millions of €
Net debt at 31 December 2020	100
2021e operating profits	60
2021e net profits	32

4/You have to value Nestlé, the Swiss food group, using a peer-comparable method. In 2020, Nestlé earned an operating income of CHF 14.2bn and had, as of 31 December 2020, a net financial debt of CHF 31.3bn. Nestlé owned 23.2% of L'Oréal, consolidated using the equity method and whose market cap as of 31 December 2020 was €174bn (CHF 188bn). If the 2020 EBIT multiple of food groups was 20, what is your estimation of the equity value of Nestlé?

5/Practise using the valuation case studies Medica and Pirelli available at www.vernimmen.com.

ANSWERS

Question

1/*Free cash flows.*

2/*A liquidity discount only. For a private company, the liquidity issue for a minority shareholder will be much more important as probably no one will want to buy this minority stake (apart maybe from the majority shareholder!). Stock market for a minority shareholder provides some (if not perfect) liquidity, except for small companies with a low free float.*

3/*Synergy results from a reduction in charges or an improvement in products due to mergers or acquisitions that leads to the value of the new group being greater than the sum of the values of its parts.*

4/*No, as the P/E ratio can only be used with net income.*

5/*A company with a large market share, very well run in a market segment which does not interest trade buyers.*

6/*DCF value, sum-of-the-parts value, sum-of-the-parts value, sum-of-the-parts value, DCF value, DCF value.*

7/*Yes, because an asset can have a value for an investor or a trade buyer that differs from its value within the company of which it is currently part.*

8/*It looks like the sum-of-the-parts method but it is actually a multiple of EBIT as EBIT is a similar percentage of sales across the sector.*

9/*Inventories, quality of the estate's land.*

10/*Sum-of-the-parts value.*

11/*Yes, due to expected synergy gains.*

12/*High-tech and Internet companies, Louis Vuitton and Gucci.*

13/*Yes, for an LBO due to a better governance. Yes, improved management, more efficient allocation of resources and synergies.*

14/*Yes, if the improvement in margin is a one-off event that will last for only one year, as the reduction in working capital generates a change in cash flow for only one year. And no, if the increase in margin is here to stay resulting in a permanent improvement in cash flows.*

15/*Because you have to choose where to position the company to be valued among its peers and mean or median is the answer for those who do not know how to make a choice.*

16/*Trees do not grow until they reach the sky – ROCE cannot be higher than WACC forever.*

17/*No. At the end of the day it will be value-creative for the new group. Who gets it (the acquirer or the target's shareholders) is a question of negotiation between them.*

18/*That the best time to sell a private company is when stock markets are high.*

19/*With the DCF method, this exceptional variation in the working capital would be corrected in the first discounted cash flow period by an (equivalent) variation in the opposite direction. In the multiple method, the net debt used in the calculation should be reduced by this exceptional increase in the working capital.*

Exercises

A detailed Excel version of the solutions is available at www.vernimmen.com.

1/*Present value with profits of 21: €86.4m. Present value with profits of 14: €17.6m. A one-third drop in profits reduces the value by more than 80% – very high volatility of value.*

2/*Cost of capital 7.9%. Enterprise value €7,387m. Equity value €5,137m.*

Years	**1**	**2**	**3**	**4**	**5**	**Terminal value**
EBITDA	912	981	1,050	1,038	1,068	
− Corporate income tax	216	246	279	273	285	
− Change in working capital	50	50	0	0	0	
− Capital expenditure	300	300	300	300	300	
= Free cash flows	346	385	471	465	483	8307

4/*Equity value = €480m = 15 × €32m or 10 × €60m – €100m = €500m.*

5/*Nestlé value of equity = 20 × 14.2 + 23.2% × 188 – 31.3 = CHF 296.3bn.*

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NOTES

1 *Earnings before interest, taxes, depreciation and amortisation.*

2 *All the more so as in mature sectors inflation is lower than in the economy in general.*

3 *NOPAT (EBIT after tax) – WACC × Capital employed.*

4 *Including the value of hedging instruments, if any.*

5 *The interest rate calculated as interest in the income statement/net debt in the closing balance sheet does not reflect the actual interest rates paid on the ongoing debt during the year.*

6 *That is, before 1995 in Europe and the US.*

7 *Basel III and IV.*

8 *Which could be the case under IFRS.*

9 *For more on this, see the* Vernimmen.com *Newsletter no. 24, May 2007.*

10 *Not that of subsidiaries, as it has already been taken into account when valuing the subsidiaries.*

11 *Acquisition of assets will most often generate deductible depreciation whereas acquisition of shares of a company will generate goodwill, which in most European countries does not give rise to tax-deductible amortisation.*

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Section IV
CORPORATE FINANCIAL POLICIES

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PART ONE
CAPITAL STRUCTURE POLICIES

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Chapter 32
CAPITAL STRUCTURE AND THE THEORY OF PERFECT CAPITAL MARKETS

Does paradise exist in the world of finance?

The central question of this chapter (and of the following one) is: is there an optimal capital structure? That is to say, is there a “right” combination of equity and debt that allows us to reduce the weighted average cost of capital and therefore to maximise the value of capital employed (enterprise value)?

The reader may be surprised by this question when Chapter 13 showed clearly how return on equity could benefit from the leverage effect. But we have now left the world of accounting in order to enter the universe of finance. Indeed, if we jumped straight to the conclusion, this part of the book could be renamed “the uselessness of the leverage effect in finance”!

Note that we consider the weighted average cost of capital (or cost of capital), denoted *k*, to be the rate of return required by all the company's investors either to buy or to hold its securities. **It is the company's cost of financing and the minimum return its investments must generate in the medium term. If not, the company is heading for ruin.**

k_D is the rate of return required by the lenders of a given company, k_E is the cost of equity required by the company's shareholders, and *k* is the weighted average rate of the two types of financing, equity and net debt (from now on often referred to simply as debt). The weighting reflects the breakdown of the value of equity and the value of debt in enterprise value.

With V_D the market value of net debt and V_E the market value of equity, we get:

$$k = k_D \times (1 - T_C) \times \left(\frac{V_D}{V_D + V_E} \right) + k_E \times \left(\frac{V_E}{V_D + V_E} \right)$$

or, since the enterprise value is equal to the value of net debt plus equity ($EV = V = V_E + V_D$):

$$k = k_{\mathrm{D}} \times (1 - T_C) \times \left(\frac{V_{\mathrm{D}}}{V} \right) + k_{\mathrm{E}} \times \left(\frac{V_{\mathrm{E}}}{V} \right)$$

If, for example, the rate of return required by the company's creditors is 4%, the corporate tax rate is 25%, the rate of return required by the shareholders is 10% and the value of debt is equal to that of equity, then the return required by all of the company's sources of funding will be 6.5%.[1] Its weighted average cost of capital is thus 6.5%.

To simplify our calculations and demonstrations in this chapter, we shall assume infinite durations for all debt and investments. This enables us to apply perpetual bond analytics and to assume that the company's capital structure remains unchanged during the life of the project, income being distributed in full. The assumption of an infinite horizon is just a convention designed to simplify our calculations and demonstrations, but they remain accurate even with more realistic hypotheses.

Section 32.1 THE ENTERPRISE VALUE

While accounting looks at a company by examining its past and focusing on its costs, finance is mainly a projection of the company into the future. Finance reflects not only risk but also – and above all – the value that results from the perception of risk and future returns.

> In finance, everything is about the future – return, risk and value.

From now on, we will speak constantly of value. As we saw previously, by value we mean the present value of future cash flows discounted at the rate of return required by investors:

equity (*E*) will be replaced by the **value of equity** (V_E);

net debt (*D*) will be replaced by the value of net debt (V_D);

capital employed (*CE*) will be replaced by enterprise value (*EV*), or firm value.

As operating assets are financed by equity and net debt (which are **accounting** concepts), logically, a company's enterprise value will consist of the market value of net debt and the market value of equity (which are **financial** concepts). This chapter therefore reasons in terms of:

> Enterprise value = Value of net debt + Equity value

Enterprise value or firm value (*EV*)	Value of net debt (V_D)
	Equity value (V_E)

Important: Enterprise value is sometimes confused with equity value. Equity value is the enterprise value remaining for shareholders after creditors have been paid. To avoid confusion, remember that **enterprise value is the sum of equity value and net debt value**.

Similarly, we will reason not in terms of return on equity, but rather required rate of return, which was discussed in depth in Chapter 19. In other words, the accounting notions of **ROCE (return on capital employed), ROE (return on equity) and *i* (cost of debt)**, which are based on past observations, will give way to **WACC or *k* (required rate of return on capital employed)**, **k_E(required rate of return on equity) and k_D(required rate of return on net**

debt), which are the returns required by those investors who are financing the company and who hope to get them.

Section 32.2 DEBT AND EQUITY

The fundamental differences between debt and equity should now be crystal clear.

Debt:

- provides a return for the investor that is independent of the performance of the firm. Except in extreme cases (default, bankruptcy), the lender will earn the interest due (no more, no less) regardless of whether the earnings of the company are excellent, average or bad;
- always has a term, even if remote in time, that is defined contractually. We will not consider for the time being the extremely rare cases of perpetual debts (which are usually only named so when you analyse them more carefully) or a bit more frequent debt with undetermined term;
- is repaid in priority to equity in case of liquidation of the company – the proceeds of the sale of assets will primarily go to lenders, and only if and when lenders have been fully repaid will shareholders receive cash.

Equity:

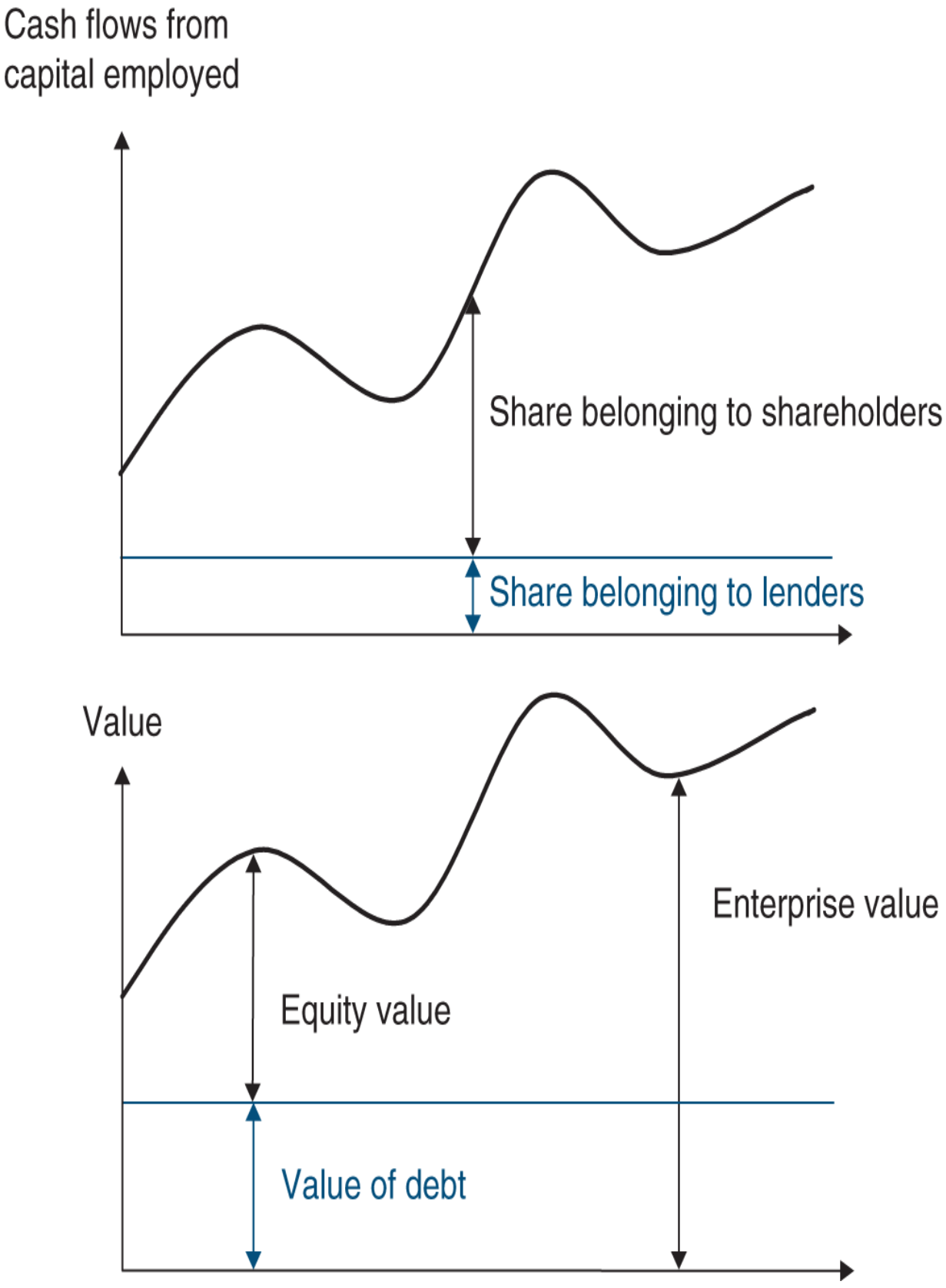
- yields returns depending on the profitability of the company. Dividends and capital gains will be nil if the results are not good on a long-term basis;
- does not benefit from a repayment commitment. The only exit for equity can be found by selling to a new shareholder, which will take over the role from the previous one;
- in case of bankruptcy is repaid only after all creditors have been fully repaid. Our readers probably know that in most cases the proceeds from liquidation are not sufficient to repay 100% of creditors. Shareholders are then left with nothing as the company is insolvent.

Shareholders fully run the risk of the firm as the cash flows generated by the capital employed (free cash flows to the firm) will first be allocated to lenders; only when they have collected what is due will shareholders be entitled to the remainder.

Given these elements, it becomes natural that the voting rights and therefore the right to choose management lies in the hands of shareholders. Voting rights are only a logical consequence of the first three differences. **Shareholders, second to lenders in the collection of cash flows generated by capital**

employed, run greater risks than the lenders. Lenders are willing to entrust shareholders with power within the company, especially the power to choose the management through voting rights, because they know that it is in the shareholders' interest to manage the company optimally to maximise its cash flows over time, since the shareholders will only receive a share if the cash flows are sufficient to ensure that the lenders receive what is owed to them first.

The higher the enterprise value, the higher also the equity value. As debt does not run the risk of the firm (except in case of financial distress), its value will largely be independent of the changes in enterprise value. We find here again the concept of leverage, as a small change in enterprise value can have a large impact on equity value.


Cash flows from
capital employed
Share belonging to shareholders
Share belonging to lenders
Value
Enterprise value
Equity value
Value of debt

It should be noted that these two graphs are not on the same scale (the first one on annual cash flows, the second one on values).

For an investor, equity is naturally more risky than debt.

Section 32.3 WHAT OUR GREAT-GRANDPARENTS THOUGHT

We shall start by assuming a tax-free environment, both for the company and the investor, in which neither income nor capital gains are taxed. In other words, an illusionary heaven! Concretely, the optimal capital structure is one that minimises k, i.e. that maximises the enterprise value (V). Remember that the enterprise value results from discounting free cash flow at rate k. However, free cash flow is not related to the type of financing. The demonstrations below endeavour to measure and explain changes in k according to the company's capital structure.

> According to conventional wisdom, there is an optimal capital structure that maximises enterprise value by the judicious use of debt and the leverage it offers. This enables the company to minimise its weighted average cost of capital – that is, the overall cost of financing.

We know that *ex-ante* debt is always cheaper than equity ($k_D < k_E$) because it is less risky. Consequently, a moderate increase in debt will help reduce k, since a more expensive resource (equity) is being replaced by a cheaper one (debt). This is the practical application of the preceding formula and the use of leverage.

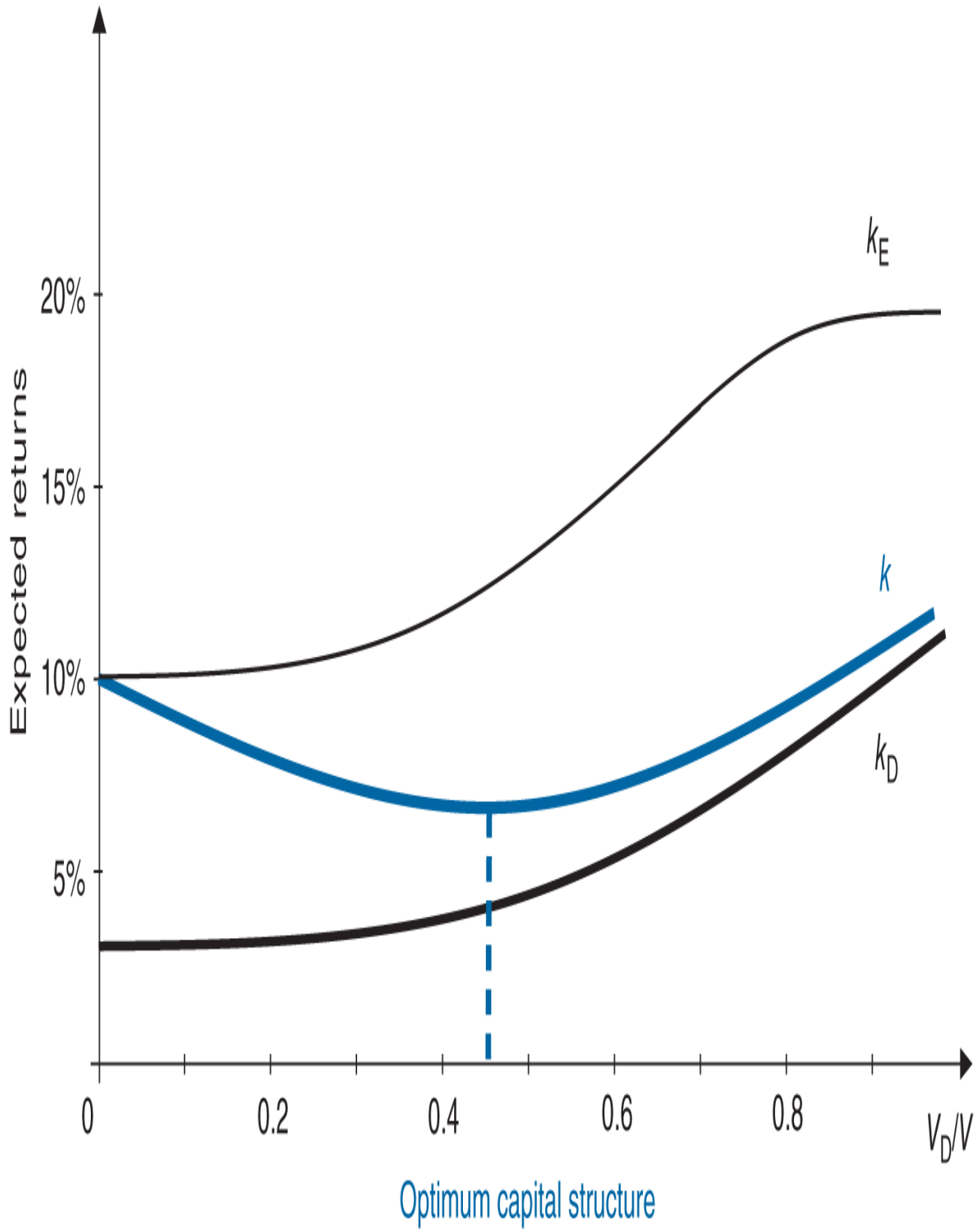
However, any increase in debt also increases the risk for the shareholder. Markets then demand a higher k_E, the more debt we add in the capital structure. The increase in the expected rate of return on equity cancels out part of the decrease in cost arising on the recourse to debt. The higher the relative share of debt, the greater the risk to shareholders and the more shareholders demand a high rate of return on equity, to the point of cancelling out the positive effect of the use of debt.

At this level of financial leverage the company has achieved the optimal capital structure, ensuring the lowest weighted average cost of capital and thus the highest enterprise value. Should the company continue to take on debt, the resulting gains would no longer offset the higher return required by shareholders.

Moreover, the cost of debt increases after a certain level because it becomes more risky. At this point, not only has the company's cost of equity increased,

but also that of its debt.

Conventional approach to optimal capital structure



According to the traditional approach, an optimal capital structure can be achieved where the weighted average cost of capital is minimal, with some – but not too much – leverage.

In this example, the debt-to-equity ratio that minimises k is 0.45. The optimal capital structure is thus achieved with 45% debt financing and 55% equity financing.

Section 32.4 THE CAPITAL STRUCTURE POLICY IN PERFECT FINANCIAL MARKETS

The perfect markets theory of capital structure contradicts the traditional approach. It states that, barring any distortions, there is *no one* optimal capital structure.

We shall demonstrate this proposition by means of an example given by Franco Modigliani and Merton Miller (1958), who showed that, in a perfect market and without taxes, the traditional approach is wrong. **If there is no optimal capital structure, then the overall cost of equity (*k* or WACC) remains the same regardless of the firm's debt policy.**

The main assumptions behind the theorem are:

companies can issue only two types of securities: risk-free debt and equity;

financial markets are frictionless;

there is no corporate and personal taxation;

there are no transaction costs;

firms cannot go bankrupt;

insiders and *outsiders* have the same set of information.

According to Modigliani and Miller, investors can take on debt just like companies. So, in a perfect market, they have no reason to pay companies to do something they can handle themselves at no cost.

Imagine two companies that are completely identical except for their capital structure. The value of their respective debt and equity differs, but the sum of both, i.e. the enterprise value of each company, is the same. If the reverse were true, equilibrium would be restored by arbitrage.

We shall demonstrate this using the examples of Companies X and Y, which are identical except that X is unlevered and Y carries debt of 80,000 at 5%. If the traditional approach were correct, Y's weighted average cost of capital would be lower than that of X and its enterprise value higher. This can be seen in the following table:

	Company X	Company Y
Operating profit: *EBIT*	20,000	20,000
Interest expense (at 5%): *IE*	0	4,000
Net profit: *NP*	20,000	16,000
Dividend: $DIV = NP$[2]	20,000	16,000
Cost of equity: k_E	10%	12%
Equity value: $V_E = DIV/k_E$	200,000	133,333
Debt value: $V_D = IE/k_D$	0	80,000
Enterprise value: $V = V_E + V_D$	200,000	213,333
Weighted average cost of capital: $k = EBIT/V$[3]	10%	9.4%
Gearing: V_D/V_E	0%	60%

Y's cost of equity (12%) is higher than that of X (10%), since Y's shareholders bear both the operating risk and that of the capital structure (debt), whereas X's shareholders incur only the same operating risk. As a matter of fact, the operating risk of X is the same as that of Y, as X and Y are identical but for their capital structures.

Modigliani and Miller demonstrated that Y's shareholders can achieve a higher return on their investment by buying shares of X, at no greater risk.

Thus, if a shareholder holding 1% of Y shares (equal to 1,333) wants to obtain a better return on their investment, they must:

sell their Y shares for 1,333…

… **replicate** Y's debt/equity structure by borrowing money for 60% of the equity value, in proportion to their 1% stake; that is, borrow 1,333 × 60% = 800, at 5% …

… invest all this (800 + 1,333 = 2,133) in X shares.

The shareholder's risk exposure is the same as before the operation: they are still exposed to operating risk, which is the same on X and Y, as well as to financial risk, since their exposure to Y's debt has been transferred to their personal borrowing for the same amount (1% of 80,000 or 800). The situations are therefore financially equivalent. Previously, the shareholder of Y was not indebted in their personal capacity and was a shareholder of a company Y with

a financial leverage of 60%. Now they have a personal leverage of 60% (800 / 1,333) but is a shareholder of a company X without debt.

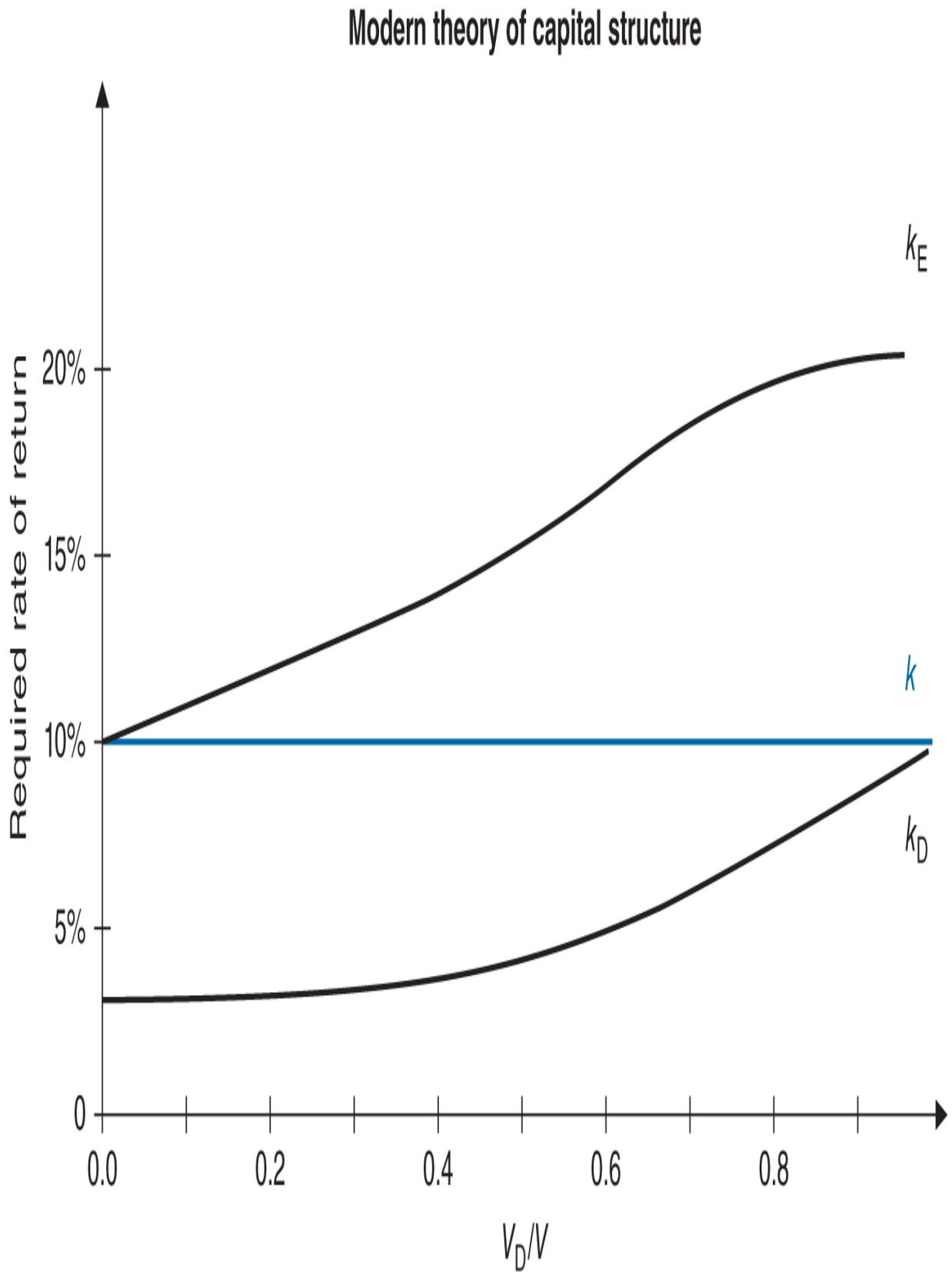
Formerly, the investor received annual dividends of 160 from Company Y (12% × 1,333 or 1% of 16,000). Now, their net income on the same investment will be:

Dividends (Company X)	2,133 × 10% = 213
− Interest expense[4]	800 × 5% = 40
= Net income	= 173

They are now earning 173 every year instead of the former 160, on the same personal amount invested and with the same level of risk.

Y's shareholders will thus sell their Y shares to invest in X shares, reducing the value of Y's equity and increasing that of X. This arbitrage will cease as soon as the enterprise values of the two companies come into line again.

Thus, barring any distortions, the enterprise value of a company must be independent of its financing policy.


Modern theory of capital structure
Required rate of return
20%
15%
10%
5%
0
k_E
k
k_D
0.0
0.2
0.4
0.6
0.8
V_D/V

It can be seen that as k_D increases, the rate of progression of k_E slows down, so that k remains constant.

This relieves the shareholders of part of the company's risk, which is transferred to the creditors as soon as the amount of the debt becomes significant (see Chapter 34):

V_D/V	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
k_D	3%	3.1%	3.2%	3.4%	3.7%	4.2%	5.0%	6.2%	7.5%	8.8%
k_E	10%	10.8%	11.7%	12.8%	14.2%	15.7%	17.4%	18.7%	19.8%	20.3%
k	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%

In an efficient market, the increase in expected profitability due to the leverage of debt and the increase in risk offset each other, so that the share value remains the same.

> The increase in a company's level of indebtedness increases the risk for the shareholder but also increases the return required by shareholders, so that, in total, the shareholders' wealth remains unchanged.

Investing in a leveraged company is neither more expensive nor cheaper than investing in a company without debt; in other words, the investor should not pay twice, first when buying shares at enterprise value and then to reimburse the debt. The value of the debt is deducted from the value of the capital employed to obtain the price paid for the equity.

While obvious, this principle is frequently forgotten. And yet it should be easy to remember: the value of an asset, be it a factory, a painting, a subsidiary or a house, is the same regardless of whether it was financed by debt, equity or a combination of the two. As Merton Miller explained when receiving the Nobel Prize for Economics, “it is the size of the pizza that matters, not how many slices it is cut up into”.

Or, to restate this: the weighted average cost of capital does not depend on the sources of financing. True, it is the weighted average of the rates of return required by the various providers of funds, but this average is independent of its different components, which adjust to any changes in the financial structure. Increasing indebtedness (i.e. a resource with a low cost) seems *a priori* to lower the cost of capital. But this is forgetting that increasing debt will increase

its cost, automatically inducing additional leverage, therefore an increase in risk for shareholders. This increase in the risk that they bear will mechanically translate into an increase in the rate of return that they demand on equity and finally into a constancy of the global company's cost of financing.

> The weighted average cost of capital is constant whatever the financial structure.

In Chapter 33 we will deepen this analysis by integrating into our reasoning parameters that have been neglected until now (taxation, interests, bankruptcy costs) which will show that the choice of a financial structure is more complicated than what we have just seen, without however calling into question the conclusion of this chapter.

SUMMARY

The summary of this chapter can be downloaded from www.vernimmen.com.

Is there such a thing as an optimal capital structure, i.e. a way of splitting the financing of operating assets between debt and equity which would enhance the value of the operating assets and minimise the company's cost of capital? This is the central question that this chapter attempts to answer.

The real-world camp says yes, but without being able to prove it, or to set an ideal level of net debt and equity.

Modigliani and Miller said no in 1958, and showed how, if it were so, there would be arbitrages that re-established the balance.

For an investor with a perfectly diversified portfolio, and in a tax-free universe, there is no optimal capital structure. The following rules can be formed on the basis of the above:

if no taxes are levied, value cannot be instantly created by the choice of a "good" capital structure;

Selling a given company in shares only, or in a whole range of different securities (shares, debt, hybrid shares), will not change the value of its operating assets;

the debt leverage effect on accounting returns is an illusion. The cost of capital is linked to the company's assets and is independent from the method of financing.

But a world without taxes is a Utopia, which is why the next chapter brings tax and other "distortions" into the equation.

QUESTIONS

1/Why is the cost of equity for a company with no debt equal to the average weighted cost of capital?

2/What is the cost of capital equal to?

3/What are the two risks incurred for a shareholder of an indebted company?

4/Of the following decisions, which one is the most important: An investment decision? A financing decision? Why?

5/Explain what impact an increase in debt will have on the β of shares.

6/What are Modigliani and Miller's theories based on?

7/The fact that shareholders' expected returns rise with the level of debt does not run contrary to the approach taken by Modigliani and Miller. Why?

8/Is the cost of capital an accounting or financial concept?

9/Why can it be dangerous to use a spreadsheet to create simulations of the cost of capital?

10/Can a company create value by going into debt?

11/What is the cost of the net debt of a company that has no more shareholders' equity? And the cost of capital?

12/What are we forgetting when we say that by increasing return on equity, the leverage effect of debt cannot increase value?

13/True or false? “By reducing financial leverage, we reduce the cost of debt and the cost of equity and, accordingly, the weighted average cost of capital?” Why?

14/True or false? “The more debt we incur, the higher the interest rate we are charged. Our shareholders also require a higher return. So, if we want a low cost of capital, we have to have a low level of debt.” Why?

15/What type of investors engage in the arbitrations described by Modigliani and Miller?

You'll find more questions at www.vernimmen.com.

EXERCISES

1/60% of Company A's needs are equity-financed at a cost of 9%, and 40% are debt-financed at 5%. Excluding tax, what is the weighted average cost of capital of this company?

2/In a tax-free world, Companies B and C are similar in every respect, except for their capital structures. B has no debts while C has debts of 24,000 at 5%. The companies have been valued as follows:

	Company B	**Company C**
Operating income	10,000	10,000
Financial expense	0	1,200
Net income	10,000	8,800
k_E	8%	11%
V_E	125,000	80,000
V_D	0	24,000
V	125,000	104,000
k	8%	9.62%
$V_D/(V_E + V_D)$	0%	23%
Payout	100%	100%

You own 1% of Company B's shares. How much will you receive every year? Show how you can increase this amount without altering the amount of your investment or increasing the level of risk.

When will arbitrage cease? What will the P/E be for Companies B and C?

3/A company with no debts has a weighted average cost of capital of 8%.

What is the cost of equity for this company?

It decides to borrow 33.3% of the value of its operating assets at a rate of 5% in order to finance a share buy-back of the same amount. What is the cost of equity now?

If the market risk premium is 4% and the β of the company's shares before it went into debt was 1.2, what is the new β of shares after the capital reduction?

Why does the formula of Section 29.2, 1/, not allow you to find the previous result?

What is the β of the debt if the β of the capital employed is equal to the average β of the equity and the β of the debt weighted by the relative share of debt and equity in financing the capital employed?

$$\left(\beta = \beta_E \times \frac{V_E}{V_E + V_D} + \beta_D \times \frac{V_D}{V_D + V_E}\right)$$

4/Deutsche Telekom and Orange have a similar economic risk. The beta of Orange shares is 0.67, and it is 0.8 for Deutsche Telekom. If the risk-free rate is 3% and the equity risk premium is 9%, what are the shareholders' required returns? If the net debt/shareholders' equity ratio is 1 in value for Orange, what is it for Deutsche Telekom, which has a cost of debt of 5.4% compared with 5% for Orange (imagine that this is a tax-free world)?

ANSWERS

Questions

1/*Because shareholders' equity alone bears the risk of operating assets.*

2/*The average weighted by the values of the cost of equity and the cost of net debt.*

3/*The risk of operating assets and the risk of capital structure.*

4/*Investment, because it is easier to create value by making a good investment, and we learnt in this chapter that there is no such thing as good financing as for value creation.*

5/*Debt capital, by increasing the risk of shares, increases their β.*

6/*Arbitrage.*

7/*Because the risk also increases.*

8/*Financial, because only market values (rates and values) come into the calculation of the cost of capital, it corresponds to the return required by investors and not to accounting returns of the firm.*

9/*Because by modifying the relative weights of debt/shareholders' equity, we often forget that the cost of shareholders' equity and debt depends on this relative weight, and that they are not constant, no matter what the capital structure.*

10/*No, this would be too good to be true and all companies would have huge debts, which is far from the reality.*

11/*It is equal to the cost of shareholders' equity of a debt-free company in the same sector as lenders have become shareholders in practice. Ditto.*

12/*The risk of shareholders' equity increases and accordingly the returns required by shareholders increases at the same time which compensate the increase in actual returns. Overall it is neutral on value.*

13/*False, by reducing leverage, an "expensive" resource (shareholders' equity, the cost of which is reduced) replaces a "cheap" resource (debt, the cost of which is reduced). In sum, the weighted average cost of capital remains constant.*

14/*False, the company is replacing an "expensive" resource (shareholders' equity) with a "cheap" resource (debt) even though the cost will rise. In sum, the weighted average cost of capital remains constant.*

15/*Typically hedge funds, which can easily go into debt.*

Exercises

A detailed Excel version of the solutions is available at www.vernimmen.com.

1/$k = 60\% \times 9\% + 40\% \times 5\% = 7.4\%$.

2/*A shareholder of 1% of Company B will receive the following sum every year:* $1\% \times 125{,}000 \times 8\% = 100$. *They sell their shares in Company B and buy shares in Company C. However, because the company is indebted, as a shareholder they carry a higher risk than before. If they want to keep the same level of risk, they must put an equivalent amount into the debt underlying the shares they have bought in Company C. Accordingly, if n is the percentage of 1,250 paid for the shares in Company C,* $n \times 23.1\% = 1 - n$. *The solution to this equation is* $n = 1 / (1 + 23.1\%) = 81\%$. *Or, for assets totalling 1,250: 19% is lent at 5% and 81% is invested in Company C shares. Which is an income of* $19\% \times 1{,}250 \times 5\% + 81\% \times 1{,}250 \times 11\% = 123$, *more than the initial income of 100. Arbitrage will cease when the value of the capital employed of Companies B and C is equal, for example 111,400, which gives an equity value for Company C of 114,000 – 24,000 = 90,000 and a P/E of 10.2 for Company C and 11.4 for Company B.*

3/*(a)* $k_E = 8\%$. *(b)* $k_E = (8\% - 5\% \times 33.3\%) / 66.7\% = 9.5\%$. *(c) Subtracting the equation of cost of equity with and without debt allows to deduce that* $\beta = 1.57$. *(d) As debt is not negligible, being one third of the enterprise value (e)* $\beta_D = 0.45$.

4/*DT:* $k_E = 3\% + 0.8\% \times 9 = 10.2\%$; *Orange:* $k_E = 9\%$; $V_D/V_E = 2$.

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NOTES

1 *4% × (1 − 25%) × 50/100 + 10% × 50/100 = 6.5%*.

2 *To simplify calculations, the payout ratio is 100%*.

3 *To simplify calculations, we adopt an infinite horizon with constant flows*.

4 *It is not absurd to think that the interest rate will be the same as before, especially if we speculate that firm X's shares held by the investor are given to the lending bank as collateral*.

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Chapter 33
CAPITAL STRUCTURE, TAXES AND ORGANISATION THEORIES

There's no gain without pain

In the previous chapter we saw that the value of a firm is the same whether or not it has taken on debt. True, shareholders will pay less for the shares of a levered company, but they will have to pay back the debt (or buy it, which amounts to the same thing) before obtaining access to the enterprise value. In the end, they will have paid, directly or indirectly, the same amount (value of equity plus repayment of net debt[1]); that is, the enterprise value.

Now, what about the financial manager who must issue securities to finance the creation of enterprise value? It does not matter whether they issue only shares or a combination of bonds and shares, since again the proceeds will be the same – the enterprise value.

Enterprise value depends on future flows and how the related, non-diversifiable risks are perceived by the market.

But if that is the case, why diversify sources of financing? The preceding theory is certainly elegant, but it cannot fully explain how things actually work in real life.

In this chapter we look at **two basic explanations of real-life happenings**. First of all, within the same market logic, biases occur which may explain why companies borrow funds, and why they stop at a certain level. The fundamental factors from which these biases spring are ***taxes and financial distress costs***. **Their joint analysis will give birth to the "trade-off model".**

There are features of debt that can modify the optimal capital structure. Trade-off models generally limit their attention to the pros and cons of tax shields and financial distress costs. We believe that the elements of the balance are more numerous than just these factors. Other factors may also be added:

information asymmetries;

disciplining role of debt;

financial flexibility;

agency costs;

signalling aspects.

Maybe the main reasons for the interference between capital structure and investment are the divergent interests of the various financial partners regarding value creation and their differing levels of access to information. This lies at the core of the manager/shareholder relationship we shall examine in this chapter. A full chapter (Chapter 34) is devoted to an analysis of the capital structure resulting from a compromise between creditors and shareholders.

> Rather than being simply a search for value, the choice of financing is far more an endeavour to reduce conflicts of interest between shareholders and managers or shareholders and lenders, as well as the information asymmetry between management and investors.

Section 33.1 THE BENEFITS OF DEBT OR THE TRADE-OFF MODEL

1/ CORPORATE INCOME TAXES

Up to now, our reasoning was based on a tax-free world, which of course does not exist. The investor's net return can be two to five times (or more) lower than the pre-tax cash flows of an industrial investment.

It would therefore be foolhardy to ignore taxation, which forces financial managers to devote a considerable amount of their time to tax optimisation.

But we ought not go to the other extreme and concentrate solely on tax variables. All too many decisions based entirely on tax considerations lead to ridiculous outcomes, such as insufficient earnings capacity or a change in fiscal regulations. Tax deficits alone are no reason to buy a company!

In 1963, Modigliani and Miller pushed their initial demonstration further, but this time they factored in corporate income tax (*but no other taxes*) in an economy in which companies' financial expenses are tax-deductible, but not dividends. This is pretty much the case in most countries.

The conclusion was unmistakable: once you factor in corporate income tax, there is more incentive to use debt rather than equity financing.

Interest expenses can be deducted from the company's tax base, so that creditors receive their coupon payments before they have been taxed. Dividends, on the other hand, are not deductible and are paid to shareholders after taxation.

Thus, a debt-free company with equity financing of 100, on which shareholders require a 7.5% return, will have to generate profit of at least 10.4 in order to provide the required return of 7.5 after 28% tax.

If, however, its financing is equally divided between debt at 4% interest and equity, a profit of 9.6 will be enough to satisfy shareholders despite the premium for the greater risk to shares created by the debt (i.e. 11%).

	Operating profit	9.6
−	Interest expense	2 or 4% of 50
=	Pre-tax profit	7.6
−	28% tax	2.1
=	Net profit	5.5, or 11% of 50

Allowing interest expenses to be deducted from companies' tax base is a kind of subsidy the state grants to companies with debt. **But to benefit from this tax shield, the company must generate a profit.**

A company that continually resorts to debt will benefit from tax savings that must be factored into its enterprise value.

When corporate income taxes are levied, the enterprise value of the levered company is equal to that of an unlevered company plus the present value of the tax savings arising on the debt.

Take, for example, a company with an enterprise value of 100, of which 50 is financed by equity and 50 by perpetual debt at 4%. Interest expenses will be 2 each year. Assuming a 28% tax rate and an operating profit of more than 2 regardless of the year under review (an amount sufficient to benefit from the tax savings), the tax savings will be 28% × 2, or 0.56 for each year. The present value of this perpetual bond increases shareholders' wealth by 0.56 / 14.5% = 3.9 if 14.5% is the cost of equity. Taking the tax savings into account increases the value of equity by 8% to 53.9 (50 + 3.9).

The longer the maturity of the debt and the larger the amount, the greater the present value of the tax savings.

TAX SAVINGS AS A PERCENTAGE OF EQUITY

		Maturity of debt		
V_D/V	k_E	5 years	10 years	Perpetuity

		Maturity of debt		
V_D/V	k_E	5 years	10 years	Perpetuity
0%	7.5%[2]	0%	0%	0%
25%	9.8%	1%	2%	4%
33%	10.9%	2%	3%	5%
50%	14.5%	4%	6%	8%
66%	21.1%	6%	9%	10%

The value of a levered company is equal to what it would be without the debt, plus the amount of savings generated by the tax shield.[3]

The question now is what discount rate should be applied to the tax savings generated by the deductibility of interest expense? Should we use the cost of debt, as Modigliani and Miller did in their article in 1963, the weighted average cost of capital or the cost of equity?

Using the cost of debt is justified if we are certain that the tax savings are permanent. In addition, this allows us to use a particularly simple formula:

$$\text{Value of the tax savings} = \frac{T_c \times k_D \times V_D}{k_D} = T_c \times V_D$$

Nevertheless, there are good reasons to prefer to discount the savings at the cost of equity, since it would be difficult to assume that the company will continually carry the same debt, generate profits and be taxed at the same rate. As the tax savings accrue to the shareholders, so should it be reasonable to discount them at the rate of return required by those shareholders.

Bear in mind that these tax savings only apply if the company has sufficient earnings power and does not benefit from any other tax exemptions, such as tax-loss carryforwards.

2/ COSTS OF FINANCIAL DISTRESS

We have seen that the more debt a firm carries, the greater the risk that it will not be able to meet its commitments. If the worst comes to the worst,

the company files for bankruptcy, which in the final analysis simply means that assets are reallocated to more profitable ventures.

For investors with a well-diversified portfolio, the cost of the bankruptcy will theoretically be nil, since when a company is discontinued, its assets (market share, customers, factories, etc.) are taken over by others who will manage them better. One person's loss is another person's gain! If the investor has a diversified portfolio, the capital losses will be offset by other capital gains.

In practice, however, markets are not perfect and we all know that even if bankruptcies are a means of reallocating resources, they carry a very real cost to those involved. These include:

Direct costs: redundancy payments, legal fees, administrative costs, shareholders' efforts to receive a liquidation dividend.

Indirect costs: order cancellations (for fear they will not be honoured), less trade credit (because it may not be repaid), reduced productivity (strikes, underutilisation of production capacity), no more access to financing (even for profitable projects); as well as incalculable human costs.

One could say that bankruptcy occurs when shareholders refuse to inject more funds once they have concluded that their initial investment is lost. In essence, they are handing the company over to its creditors, who then become the new shareholders. The creditors bear all the costs of the malfunctioning company, thus further reducing their chances of getting repaid.

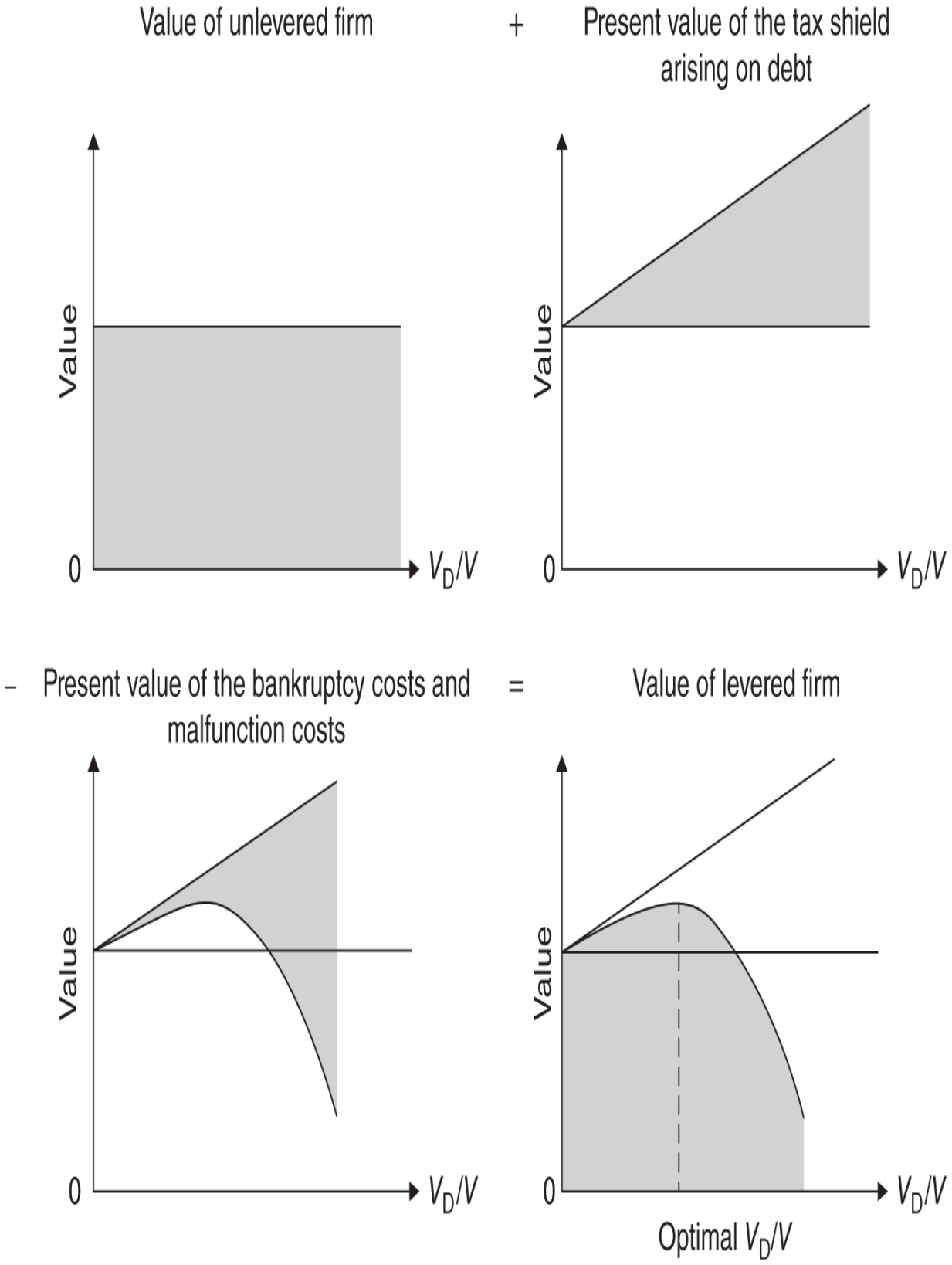
Even without going to the extremes of bankruptcy, a highly levered company in financial distress faces certain dysfunctions that reduce its value. It may have to cut back on R&D expenditure, maintenance, training or marketing expenses in order to meet its debt payments and will find it increasingly difficult to raise new funding, even for profitable investment projects.

After factoring all these costs into the equation, we can say that:

Value of levered firm	=	Value of unlevered firm	+	Present value of the tax shield arising on debt	−	Present value of bankruptcy costs and malfunction costs

or, as illustrated by the following figure:

The trade-off model



Because of the tax deduction, debt can, in fact, create value. A levered company may be worth more than if it had only equity financing. However, there are two good reasons why this advantage should not be overstated. Firstly, when a company with excessive debt is in financial distress, its tax advantage disappears, since it no longer generates sufficient profits. Secondly, the high debt level may lead to restructuring costs and lost investment opportunities if financing is no longer available. As a result, debt should not exceed a certain level.

> The theoretical optimal debt ratio appears to be when the increase in present value of the tax savings arising on additional borrowing is offset by the increase in the present value of financial distress and bankruptcy costs.

In 2000, Graham found that the value of the tax advantage of interest expenses is around 9.7%, and it goes down to 4.3% if personal taxation of investors is also considered. Almeida and Philippon (2007) have, on the other hand, estimated the bankruptcy costs; they believe the right percentage is around 4.5% – in brief, it seems that one effect “perfectly” compensates the other. More recent works quoted in the bibliography found similar results.

> What all this amounts to is that, while taxation is certainly a key parameter in absolute terms, it is unlikely to be the determinant of differences in capital structures of firms.

In fact, Modigliani and Miller's theory states the obvious: all economic players want to reduce their tax charge! A word of caution, however. Corporate managers who focus too narrowly on reducing tax charges may end up making the wrong decisions.

3/ INTRODUCING PERSONAL TAXES, A MAJOR IMPROVEMENT TO THE PREVIOUS REASONING

In 1977, Miller released a new study in which he revisited the observation made with Modigliani in 1958 that there is no one optimal capital structure.

This time, however, he factored in both corporate and **personal** taxes.

Miller claimed that the taxes paid by investors can cancel out those paid by companies. This would mean that the value of the firm would remain the same regardless of the type of financing used. Again, there should be no optimal capital structure.

Miller based his argument on the assumption that equity income is not taxed, and that the tax rate on interest income is marginally equal to the corporate tax rate. In other words, the tax advantage of debt at the level of the company is neutralised by the tax advantage of equity at the level of the investor.

Who benefits from taxation? No research has shown that the tax advantage of debt is not shared equally between creditor and debtor. In recent years, tax reforms have led to the disappearance of tax friction and thus the debt advantage is tending to disappear. For certain types of investors, there is therefore no longer any tax friction when collecting their income, which is fundamental.

Say a company has an enterprise value of 1,000. Regardless of its type of financing, investors require a 7.5% return after corporate *and* personal income taxes. Bear in mind that this rate is not comparable with that determined by the CAPM ($r_F + \beta \times (r_M - r_F)$), which is calculated **before** personal taxation.

Let's take a country where (realistically) the main tax rates are:

corporate tax: 28.4%;

tax on dividends: 17.2%;

tax on interest income: 30%.

Now let us assume that the company has an operating profit of 135. This corresponds to a cost of equity of 8% if it is entirely equity-financed.

Enterprise value	**1,000**	**1,000**	**1,000**	**1,000**
Equity	1,000	750	500	250
Debt	0	250	500	750
Interest rate		2.0%	3.0%	5.0%

Enterprise value	**1,000**	**1,000**	**1,000**	**1,000**
Operating profit	135	135	135	135
− Interest expense	0	5	15	37.5
= Pre-tax profit	135	130	120	98
− Corporate income tax at 28.4%	38	37	34	28
= Net profit	97	93	86	70
Dividend	97	93	86	70
Personal income tax:				
On dividends (17.2%)	17	16	15	12
On interest (30%)	0	2	5	11
Shareholders' net income	80	77	71	58
Shareholders' net return	8%	10.3%	14.2%	23.1%
Creditors' net income	0	4	11	26
Creditors' net return		1.4%	2.1%	3.5%
Net income for investors	80	81	82	84
Total taxes	55	54	53	51

The net return of the investor, who is both shareholder and creditor of the firm, can be calculated depending on whether net debt represents 0%, 33.3%, 100% or three times the amount of equity.

The value created by debt must thus be measured in terms of the increase in net income for investors (shareholders and creditors). Our example shows that flows do not increase significantly even when the debt level is particularly high.

Using the table below, we can even see that in certain countries, such as the UK, the tax savings on corporate debt are more than offset by the personal taxes levied.

TAX RATES IN VARIOUS COUNTRIES (%)

Country	**On dividends**	**On capital gains**	**On interests**	**On corporate earnings**

Country	On dividends	On capital gains	On interests	On corporate earnings
France	17.2%	17.2%	30%	28.41%
Germany	26.4%	26.4%	26.4%	30%–33%
Italy	26%	26%	12.5% or 26%	27.9%
Côte d'Ivoire	10% or 15%	0%	13.5% or 18%	25%
Lebanon	10%	15%	10%	17%
Morocco	10%	15% (listed) – 20%	30%	10%, 20% and 31%
Spain	19% to 26%	19% to 26%	19% to 26%	25%
Switzerland	19% to 41%	0%	19 to 41%	11.5%–24.2%
Tunisia	10%	10%	0 to 35% (income tax)	10%, 15% or 35%
UK	0%, 7.5%–32.5% or 38.1%	10% or 20%	0%, 20%, 40% or 45%	21%
US	Income tax or 0% to 20%	0 to 20%	37% (income tax)	27%

Bear in mind, too, that companies do not always use the tax advantages of debt since there are other options, such as accelerated depreciation, provisions, etc.

4/ LIMITS TO THE DEDUCTIBILITY OF INTEREST AND NOTIONAL INTEREST, THE THIRD LIMIT

In a certain number of jurisdictions, governments have introduced mechanisms to rebalance taxation of revenues from capital gains and debt.

These measures can take the form of a limitation of the deductibility of interest. For example in Belgium, France, Germany, Italy, Spain, the UK and USA, interest is deductible only up to 30% of EBITDA.

In some countries, to make equity financing more attractive, firms can deduct notional interest computed on equity from taxable income. This is the case in Belgium, Brazil and Italy.

Section 33.2 DEBT TO CONTROL MANAGEMENT

Now let's use the agency theory concepts on our first financial question: the analysis of the capital structure.

1/ DEBT AS A MEANS OF CONTROLLING CORPORATE MANAGERS

Now let us examine the interests of non-shareholder executives. They may be tempted to shun debt in order to avoid the corresponding constraints, such as a higher breakeven threshold, interest payments and principal repayments. Corporate managers are highly risk averse and their natural inclination is to accumulate cash rather than resort to debt to finance investments. Debt financing avoids this trap, since the debt repayment prevents surplus cash from accumulating.

Shareholders encourage debt as well, because it stimulates performance. The more debt a company has, the higher its risk. In the event of financial difficulties, corporate executives may lose their jobs and the attendant compensation package and remuneration in kind. This threat is considered to be sufficiently dissuasive to encourage sound management, generating optimal liquidity to service the debt and engage in profitable investments.

Shareholders are keen to leverage the firm as debt is an efficient tool to put managers under pressure and hence solve agency issues.

> Debt is a simple yet highly effective means of controlling a firm's management team.

Given that the parameters of debt are reflected in a company's cash situation while equity financing translates into capital gains or losses at shareholder level, management will be particularly intent on the success of its debt-financed investment projects. This is another, indirect, limitation of the perfect markets theory: **since the various forms of financing do not offer the same incentives to corporate executives, financing does indeed influence the choice of investment**.

This would indicate that a levered company is more flexible and responsive than an unlevered company. This hypothesis was tested and proven by Ofek, who showed that the more debt they carry, the faster listed US companies react to a crisis, by filing for bankruptcy, curtailing dividend payouts or reducing the payroll.

Debt is thus an internal means of controlling management preferred by shareholders. In Chapter 45 we shall see that another is the threat of a takeover bid.

However, the use of debt has its limits. When a group's corporate structure becomes totally unbalanced, debt no longer acts as an incentive for management. On the contrary, the corporate manager will be tempted to continue expanding via debt until the group has become too big to fail, like RBS, Fortis, AIG, Citi, etc., until the concept of “too big to fail” is tested (Lehman Brothers). This risk is called “moral hazard”.

2/ LBOS: THIS LOGIC PUSHED TO THE EXTREME

An LBO (or Leveraged Buy-Out, see Chapter 47) is the acquisition, generally by management (MBO), of all of a company's shares using largely borrowed funds. It becomes a **leveraged buildup** if it then uses debt to buy other companies in order to increase its standing in the sector. It is generally thought that the purpose of the funds devoted to LBOs is to use accounting leverage to obtain better returns. In fact, the success of LBOs cannot be attributed to accounting leverage, since we have already seen that this alone does not create value.

The real reason for the success of LBOs is that, when it has a stake in the company, management is far more committed to making the company a success. With management most often holding a share of the equity, resource allocation will be designed to benefit shareholders. Executives have a two-fold incentive: to enhance their existing or future stake in the capital and to safeguard their jobs and reputation by ensuring that the company does not go broke. It thus becomes a classic case of the carrot and the stick!

Mature, highly profitable companies with few investments to make are the most likely candidates for an LBO. Jensen (1986) demonstrated that, in the absence of heavy debt, the executives of such companies will be strongly

tempted to use the substantial free cash flow to grow to the detriment of profits by overinvesting or diversifying into other businesses, two strategies that destroy value.

> The only value created by debt is the fact that it forces managers to better manage operating assets to improve enterprise value.

Section 33.3 SIGNALLING AND DEBT POLICY

Signalling theory is based on the strong assumption that corporate managers are better informed about their companies than the suppliers of funding. This means that they are in a better position to foresee the company's future flows and know what state their company is in. Consequently, any signal they send indicating that flows will be better than expected, or that risks will be lower, may enable the investor to create value. Investors are therefore constantly on the watch for such signals. But for the signals to be credible, there must be a penalty for the wrong signals in order to dissuade companies from deliberately misleading the market.

In the context of information asymmetry, markets would not understand why a corporate manager would borrow to undertake a very risky and unprofitable venture. After all, if the venture fails, they risk losing their job or worse, if the venture causes the company to fail. So debt is a strong signal for profitability, but even more for risk. It is unlikely that a CEO would resort to debt financing if they knew that in a worst-case scenario they would not be able to repay the debt.

Ross (1977) has demonstrated that any change in financing policy changes investors' perception of the company and is therefore a market signal.

It is thus obvious that an increase in debt increases the risk on equity. The managers of a company that has raised its gearing rate are, in effect, signalling to the markets that they are aware of the state of nature, that it is favourable and that they are confident that the company's performance will allow them to pay the additional financial expenses and pay back the new debt.

This signal carries its own penalty if it is wrong. If the signal is false, i.e. if the company's actual prospects are not good at all, the extra debt will create financial difficulties that will ultimately lead, in one form or another, to the dismissal of its executives. In this scheme, managers have a strong incentive to send the correct signal by ensuring that the firm's debt corresponds to their understanding of its repayment capacity.

Ross has shown that, assuming managers have privileged information about their own company, they will send the correct signal on the condition that the marginal gain derived from an incorrect signal is lower than the sanction suffered if the company is liquidated. "*They put their money where their mouths are*." This explains why debt policies vary from one company to another: they simply reflect the variable prospects of the individual companies.

> The actual capital structure of a firm is not necessarily a signal, but any change in it certainly is.

When a company announces a capital increase, research has shown that its share price generally drops by an average of 3%. The market reasons that corporate managers would not increase capital if, based on the inside information available to them, they thought it was undervalued, since this would dilute the existing shareholdings in unfavourable conditions. If there is no pressing reason for the capital increase, investors will infer that, based on their inside information, the managers consider the share price to be too high and that this is why the existing shareholders have accepted the capital increase. On the other hand, research has shown too that the announcement of a bond issue has no material impact on share prices.

This explains why financial investors prefer to subscribe to capital increases rather than buy from existing shareholders. It is also the reason why in most countries, top managers and all directors must disclose the number of shares they hold or control in the companies they work for or of which they are board members.

Section 33.4 INFORMATION ASYMMETRIES AND THE PECKING ORDER THEORY

Having established that information asymmetry carries a cost, our next task is to determine what type of financing carries the lowest cost in this respect.

The uncontested champion is, of course, internal financing, which requires no special procedures. Its advantage is simplicity.

Debt comes next, but only low-risk debt with plenty of guarantees (pledges) and covenants restricting the risk to creditors and thus making it more palatable to them. This is followed by riskier forms of debt and hybrid securities.

Capital increases come last, because they are automatically interpreted as a negative signal. To counter this, the information asymmetry must be reduced by means of roadshows, one-to-one meetings, prospectuses and advertising campaigns. Investors have to be persuaded that the issue offers good value for money!

In an article published in 1984, Myers elaborates on a theory initially put forward by Donaldson in 1961, stating that, according to this **pecking order theory**, companies prioritise their sources of financing.

As can be seen, although corporate managers do not choose the type of financing arbitrarily, they do so without great enthusiasm, since they all carry the same cost relative to their risk. The pecking order is determined by the law of least effort. Managers do not have to “raise” internal financing, and they will always endeavour to limit intermediation costs, which are the highest on share issues.

This theory explains fairly well the situation of highly profitable listed companies with little debt because they are almost exclusively self-financing, or that of SMEs which only increase their capital when their debt capacity is saturated.

In Chapter 34 we will see how potential or actual conflicts of interest between shareholders and lenders due to the financial structure of the company can be analysed and resolved through options.

SUMMARY

The summary of this chapter can be downloaded from www.vernimmen.com.

In this chapter we went beyond the simplified structure of perfect markets, and looked at a number of different factors (tax, bankruptcy costs, information asymmetry, conflicts of interest) which make analysis more complex, but also more relevant.

Modigliani and Miller demonstrated how, when corporate tax is included in the equation (financial expenses are tax-deductible whereas dividends are not), debt financing becomes an attractive option. The value of a levered company is equal to what it would be without the debt, plus the present value of savings generated by the tax shield.

There are, however, two major drawbacks to this approach. Firstly, the higher a company's debts, the greater the probability of bankruptcy costs, whether direct or indirect. Secondly, if the personal tax situation of the investor is taken into account, this offsets the tax shield that debt enjoys at a corporate level. For individual taxpayers, the tax breaks on income on equity are better than they are for debt.

All in all, recent research shows that the costs of bankruptcy and personal taxation offset the tax advantage of debt at the corporate level. Taxation therefore does not explain capital structure.

Agency theory analyses debt as an internal means of controlling management, which has to work hard to ensure that debt repayments are met. For a mature company making healthy profits but without major growth prospects, incurring large debts is a way of discouraging managers from spending cash on risky diversification projects or rash expansion projects, which both destroy value. The LBO, an innovation of the 1980s, is what has come out of this theory. LBOs create value, not on the basis of the accounting illusion of the leverage effect, but thanks to the high motivation of managers who are under pressure to repay debts, and who have a financial incentive to work harder as a result of the potentially very lucrative profit-sharing schemes that have been set up.

Problems stemming from information asymmetry between shareholders and investors have an obvious impact on the choice of capital structure.

Managers believing that their companies are undervalued would prefer to increase debt levels rather than to issue new shares at a low price, and possibly carry out a capital increase once the share price has gone up. Similarly, a decision to use debt finance for a project is a sign of management's confidence in its ability to service the debt and an indirect sign that the project is likely to be profitable.

Pushing the information asymmetry problem to the limit brings us to the pecking order theory, which holds that managers choose sources of financing on the basis of the amount of intermediation costs and agency costs: cash flow, debt and only then a capital increase.

This takes us a long way from the simplistic assumptions made in the first models designed by Modigliani and Miller!

QUESTIONS

1/According to the approach by Modigliani and Miller (1963), how does the value of a levered company differ from the value of an unlevered company?

2/What are the two drawbacks to Modigliani and Miller's 1963 theory?

3/What is Miller's 1977 theory based on and what conclusions does he draw?

4/Describe the tax breaks for debt financing and for equity financing.

5/What are the latest tax trends with regard to sources of financing?

6/What is the value of a levered company when there is a strong likelihood that it will file for bankruptcy?

7/What is your view of the following statement: "*X* went bankrupt because its financial expenses amounted to 13% of its sales"?

8/Why do managers tend to be wary of debt?

9/Why is it a good thing for a highly profitable company that has reached maturity to carry a lot of debt?

10/From 1990 to 2021, interest rates in Europe were generally revised downwards. If Modigliani and Miller's 1963 theory was right, should debt levels of companies have increased or decreased? Debt levels actually fell. State your views.

11/According to signal theory, should undervalued companies carry more or less debt than other companies? Why?

12/If Modigliani and Miller's 1963 theory had been right, how much corporate income tax would the state have collected every year?

13/In your view, after a failed takeover bid, will the debt-to-equity ratio of the target tend to rise or fall? Why?

14/In your view, can the theories of capital structure described in this chapter be proven with as much certainty as, say, the put/call parity described in Chapter 23 that deals with options? Why?

15/Is it better to calculate a leverage ratio on the basis of book values or market values of debt and equity to assess the level of risk taken by a company? Why?

16/Does the pecking order theory imply that the company has an optimal capital structure? What are the criteria for determining capital structure according to this approach?

17/If there was an optimal debt-to-equity ratio, should it be stable over time? Why?

18/An LBO fund is prepared to pay 3,000 for operating assets if the financing is split equally between debt and equity, and 3,500 if the split is 75% debt and 25% equity. State your views.

More questions are waiting for you at www.vernimmen.com.

EXERCISES

1/70% of Company A's needs are equity-financed at a cost of 10% and 30% debt-financed at 6%. What is the weighted average cost of capital of this company if the tax rate is 20%, 50% and 80%?

2/A company is totally financed by equity capital for a market value of 200m. The only tax it has to pay is corporate income tax at a rate of 30%. Calculate the value of this company if it borrows 50m at 6% to perpetuity, to be used to repay a part of shareholders' equity. Shareholders would then require an 11% return.

3/Company C is financed by equity with a market value of 40 and by debt with a market value of 30. This debt is perpetual and its interest rate is 6%. The corporate income tax rate is 30%.

How much of C's enterprise value is due to debt? The shareholders' required rate of return is 11%.

By how much will the enterprise value increase if the company borrows 5 on the same terms as previously (assume a required rate of return of 11% to simplify calculations)?

By how much will the enterprise value fall if there is a change in the tax laws and in four years' time financial expenses will no longer be tax-deductible?

4/Redo the table on page 611 for Côte d'Ivoire and the USA assuming two situations: no debt and 500 of debt at 7%. Assume the investor and the firm are taxed in the highest bracket of the tax scale.

ANSWERS

Questions

1/*Difference: present value of tax savings due to the fact that financial expenses are tax-deductible.*

2/*The cost of bankruptcy and individual income tax.*

3/*The individual tax payable by the investor cancels out the impact of the corporate tax payable. Conclusion: no optimal capital structure.*

4/*Financial expenses are tax-deductible. Tax credit.*

5/*More favourable treatment for equity due to the drop in the corporate income tax rate, and heavier taxes on debt income for creditors.*

6/*Value of unlevered company + present value of tax saving – present value of cost of filing for bankruptcy.*

7/*This line of reasoning is false. A company goes bankrupt because its present and expected profits are inadequate compared with its risk, and not because it is carrying too much debt. If it is carrying too much debt, this is because its profits are too low, and not the other way round.*

8/*Because by increasing the risk to which their companies are exposed, they increase their chances of losing their jobs.*

9/*Because it can avoid using its free cash flows, it will not destroy value by diversifying or making unprofitable investments.*

10/*Debt levels should have risen to set off the drop in interest rates so that tax-deductible financial expenses at least remained constant. Conclusion: either this theory does not stand up or there are other factors which explain the situation.*

11/*More debt, because they are not keen to issue new equity while the value of their shareholders' equity is undervalued.*

12/*Close to zero, since all companies would incur sufficient debts to reduce their tax bills to zero.*

13/*Rise, as shareholders will increase pressure so that the company achieves better financial performance.*

14/*No, because we are not dealing with mathematical certainties but with behaviour.*

15/*Market value, because if the company is very profitable, its equity capital will be worth much more than its book value. A more accurate assessment of the company's ability to meet its debt repayments will then be possible.*

16/*No, because financial resources are used in a given order in line with requirements. The difference between operating inflows and investment outflows.*

17/*No, because interest rates, tax rates, risk aversion, volatility of operating assets, the maturity of a sector, etc. change over time.*

18/*A difference of this amount cannot simply be due to the tax break on debt. It is also difficult to believe that management would be more motivated by the higher level of debt (50/50 is already a high level). This can only be some sort of trap.*

Exercises

1/*8.44%; 7.9%; 7.36%.*

2/*200 + 50 × 30% × 6% / 11% = 208.2.*

3/

(30 × 6% × 30%) / 11% = 4.9.

The value increases by 0.8.

Reduction of the value by 3.8.

4/*In Côte d'Ivoire there can be an incentive to increase corporate debt, not in the USA.*

	Côte d'Ivoire		**USA**	
	D = 0	**D = 500 at 7%**	**D = 0**	**D = 500 at 7%**
Operating income	135	135	135	135
− Interest expense	0	35	0	35
= Pre-tax profit	135	100	135	100
− Income tax expense	34	25	36	27
= Net earnings	101	75	99	73
Dividend paid	101	75	99	73
Income tax:				
on dividends	15	11	20	15
on interest	0	6	0	13
Shareholders' revenue	86	64	79	58
Shareholders' rate of return	8.6%	12.8%	7.9%	11.7%
Debtholders' revenue	0	29	0	22
Debtholders' revenue	0%	5.7%	0%	4.4%
Investors' revenue	86	92	79	80
Total taxes	49	43	56	55

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www.dits.deloitte.com

https://home.kpmg/xx/en/home/services/tax/tax-tools-and-resources/tax-rates-online/corporate-tax-rates-table.xhtml

NOTES

1 *Again, we use net debt and debt synonymously.*

2 *Based on a β of 1.1, a 7% risk premium and a risk-free rate of 0.5%. The other costs of equity are deduced from the formula on page 529.*

3 *This is the basis of the APV method (adjusted present value).*

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Chapter 34
DEBT, EQUITY AND OPTIONS THEORY

Light too bright to see by

The theories of corporate finance examined so far may have given the impression that the only difference between debt and equity is the required rate of return. However, **there is a big difference between the 10% return required by creditors and that required by shareholders**.

Shareholders simply hope to achieve this rate, which forms an average of rates that can be either positive or negative. The actual return can range from 0% to infinity, with the entire range of variations in between!

Creditors are assured of receiving the required rate, but never more. They can only hope to earn the 10% return but, with a few exceptions, this hope is almost always fulfilled.

So here we have the first distinction between creditors and shareholders: the probability distribution of their remuneration is completely different.

That said, although the creditor's risk is very low, it is not nil. Capitalism is built on the concept of corporation, which legally **restricts shareholders' liability with respect to creditors**. When a company defaults, shareholders hold a “trump card” that allows them to hand the company, including its liabilities, over to the lenders.

> The main financial innovation of the 19th century is the corporation.[1]

In the rest of this chapter, we will concentrate on the valuation of companies in which shareholders' responsibility is limited to the amount they have invested. This applies to the vast majority of all companies in modern capitalism, be they corporations, limited liability companies or sole proprietorship with limited liability.

This is the fundamental difference between shareholders and creditors: the former can lose their entire investment, but also hope for unlimited gains,

while the latter will at best earn the flows programmed at the beginning of the contract.

Keep this in mind as we use options to analyse corporate structure and, more importantly, the relationship between shareholders and creditors.

Section 34.1 ANALYSING THE FIRM IN LIGHT OF OPTIONS THEORY

To keep our presentation simple, we shall take the example of a joint stock company in which enterprise value *EV* is divided between debt (V_D) and equity (V_E).

We shall also assume that the company has issued only one type of debt – zero-coupon bonds – redeemable upon maturity at full face value (principal and interest) for 100.

Depending on the enterprise value when the debt matures, two outcomes are possible:

The enterprise value is higher than the amount of debt to be redeemed (e.g. *EV* = 120). In this case, the shareholders let the company repay the lenders and take the residual value of 20.

The enterprise value is lower than the amount of debt to be redeemed (e.g. *EV* = 70). The shareholders may then invoke their limited liability clause, forfeiting only their investment, and transfer the company to the lenders who will bear the difference between the enterprise value and their claim.

Now let us analyse this situation in terms of options. From an economic standpoint, shareholders have a call option (known as a European call if it can only be exercised at the end of its life) on the firm's assets. Its features are:

Underlying asset = operating assets.

Exercise price = amount of debt to be reimbursed (100).

Volatility = volatility of the underlying assets, i.e. operating assets.

Maturity = expiration date.

Interest rate = risk-free rate corresponding to the maturity of the option.

At the expiration date, shareholders either exercise their call option by repaying the lenders, or they abandon it. The value of the option is none other than the value of equity (V_E).

From the shareholders' point of view, when a company borrows funds, it is selling its “enterprise value” to its creditors, but with an option to buy it back (at the exercise price) when the debt matures. The shares of a levered company thus represent call options on its operating assets.

The lender, on the other hand, who has invested in the firm at no risk, has sold the shareholders a put option on operating assets. We have just seen that in the event of default, the creditors may find themselves the unwilling owners of the company. Rather than recouping the amount they lent, they get only the value of the company back. In other words, they have “bought” the company in exchange for the outstanding amount of debt.

The sale of this (European-style) put option results in additional remuneration for the debtholder, which, together with the risk-free rate, constitutes the total return. This is only fair, since the debtholder runs the risk that the shareholders will exercise their put option; in other words, that the company will not pay back the debt.

The features of the put option are:

Underlying asset = operating assets.

Exercise price = amount of debt redeemable upon maturity (100).

Volatility = volatility of the underlying asset, i.e. the operating assets.

Maturity = maturity of the debt.

Interest rate = risk-free rate corresponding to the maturity of the option.

The value of this option is equal to the difference between the value of the loan computed by discounting its cash flows at the risk-free rate and its market value (discounted at a rate that takes into account the default risk, i.e. the cost of debt k_D). This is the risk premium that arises between any loan and its risk-free equivalent.

All this means is that the debtholder has lent the company 103 at an interest rate equal to the risk-free rate. The company should have received 103, but the value of the loan is only 100 after discounting the flows at the normal rate of return required in view of the company's risk, rather than the risk-free rate.

The company uses the balance of 3, which represents the price of the credit risk, to buy a put option on its operating assets. In short, the company receives a net of 100 while the bank pays a net of 100 for a risky claim since it has sold a put option on its operating assets that the company, and therefore the shareholders, will exercise if its value is lower than that of the outstanding debt at maturity. By exercising the option, the company, and thus its shareholders, discharges its debt by transferring ownership of the operating assets to the creditors.

> Lending to a company is like investing in a risk-free asset and selling a put option to the shareholders at an exercise price equal to the debt to be repaid.

In conclusion, we see that, depending on the situation at the redemption date, one of the following two will apply:

if $V_D < V$, the value of the call option is higher than 0, the value of the put option is zero and equity is positive;

if $V_D > V$, the value of the call option is zero, the value of the put option is higher than 0 and the equity is worthless.

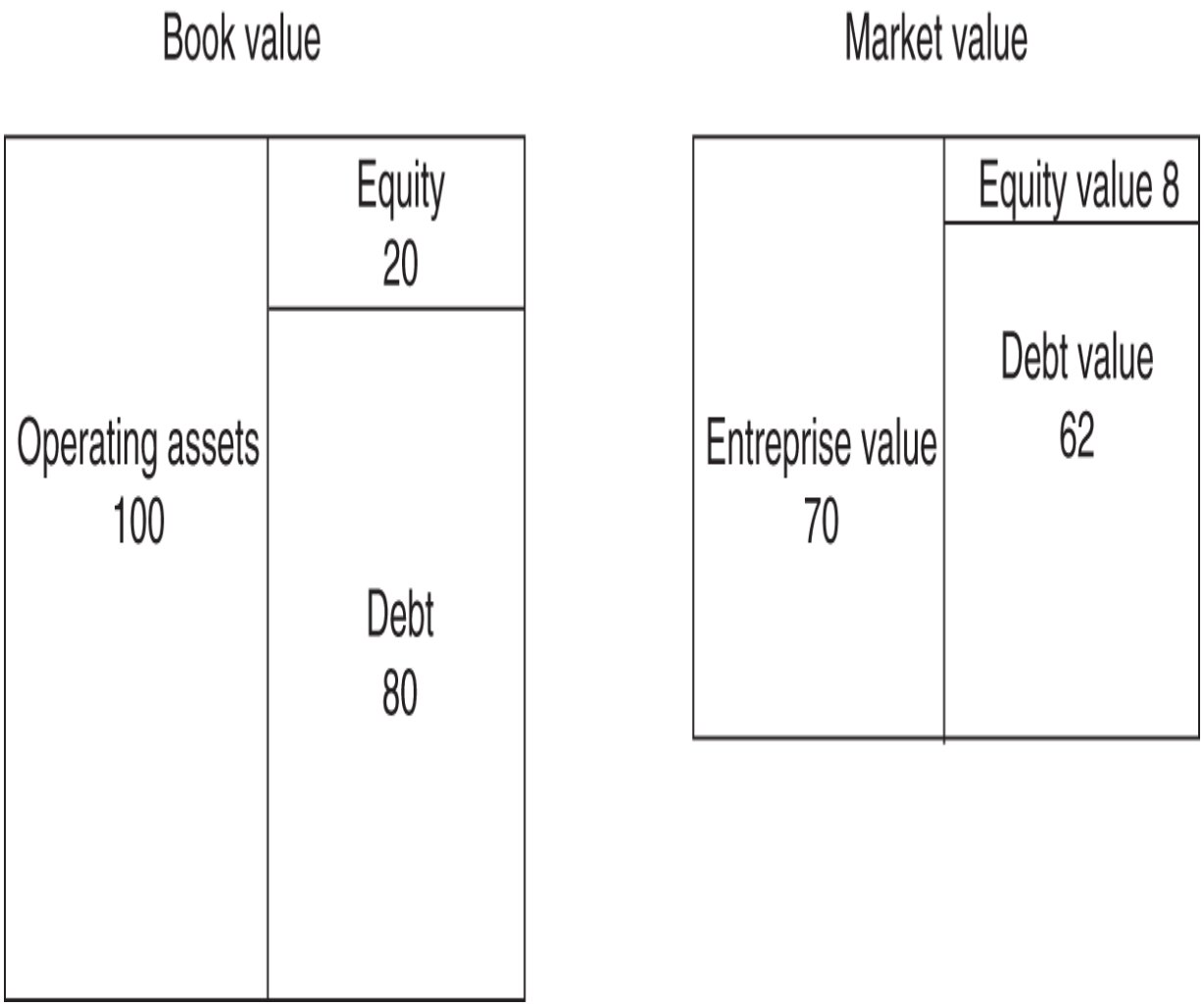
Section 34.2 CONTRIBUTION OF OPTIONS THEORY TO THE VALUATION OF EQUITY

We have demonstrated that the value of a firm's equity is comparable to the value of a call option on its operating assets. The option's exercise price is the amount of debt to be repaid at maturity, the life of the option is that of the debt, and its underlying asset is the firm's operating assets.

This means that, at the valuation date, the value of equity is made up of an intrinsic value and a time value. The intrinsic value of the call option is the difference between the present value of operating assets and the debt to be repaid upon maturity. The time value corresponds to the difference between the total value of equity and the intrinsic value.

> The main contribution of options theory to corporate finance is the concept of a time value for equity.

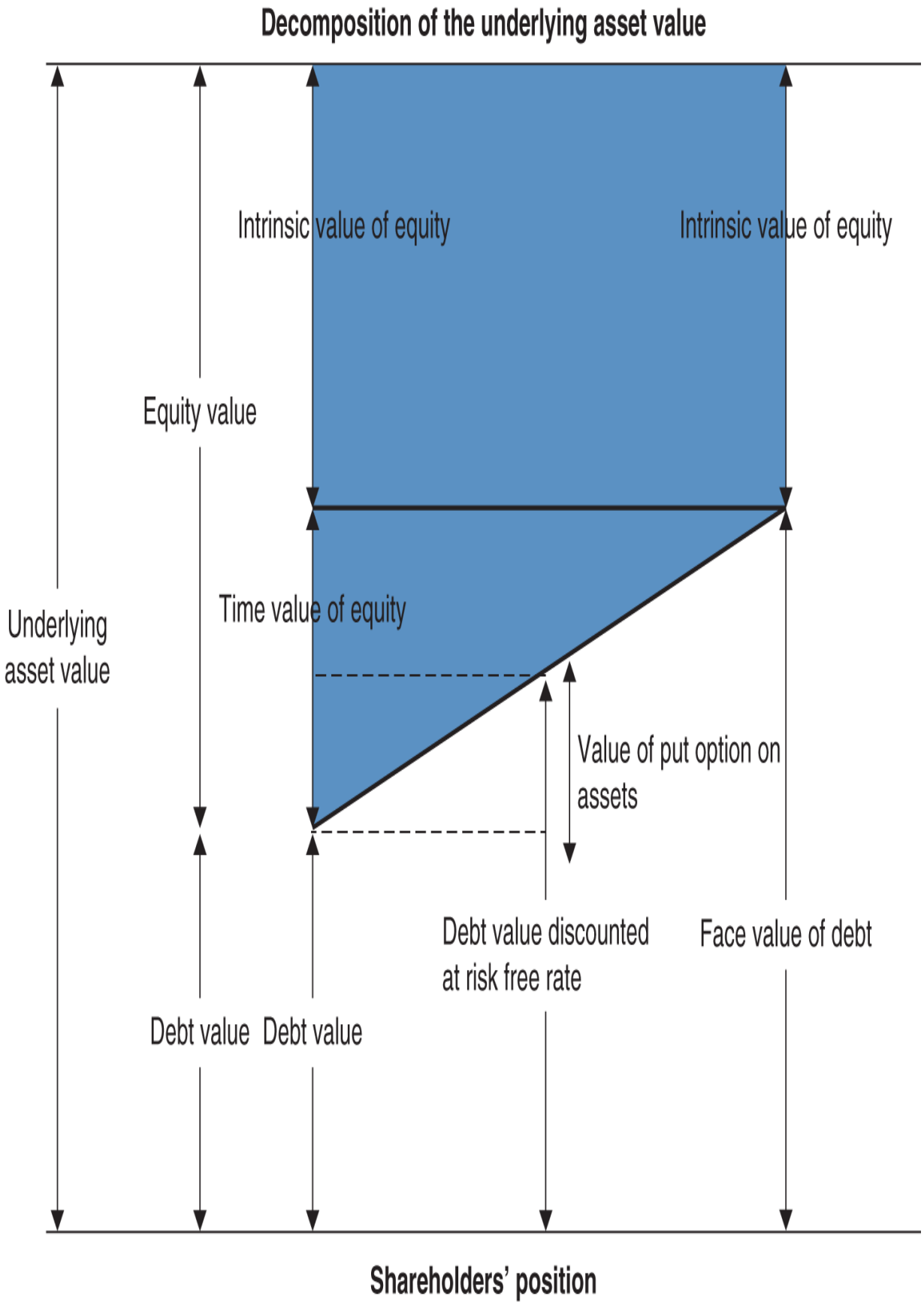
Take, for example, a company where the return on capital employed is lower than that required by investors in view of the related risk. The market value is thus lower than the book value:



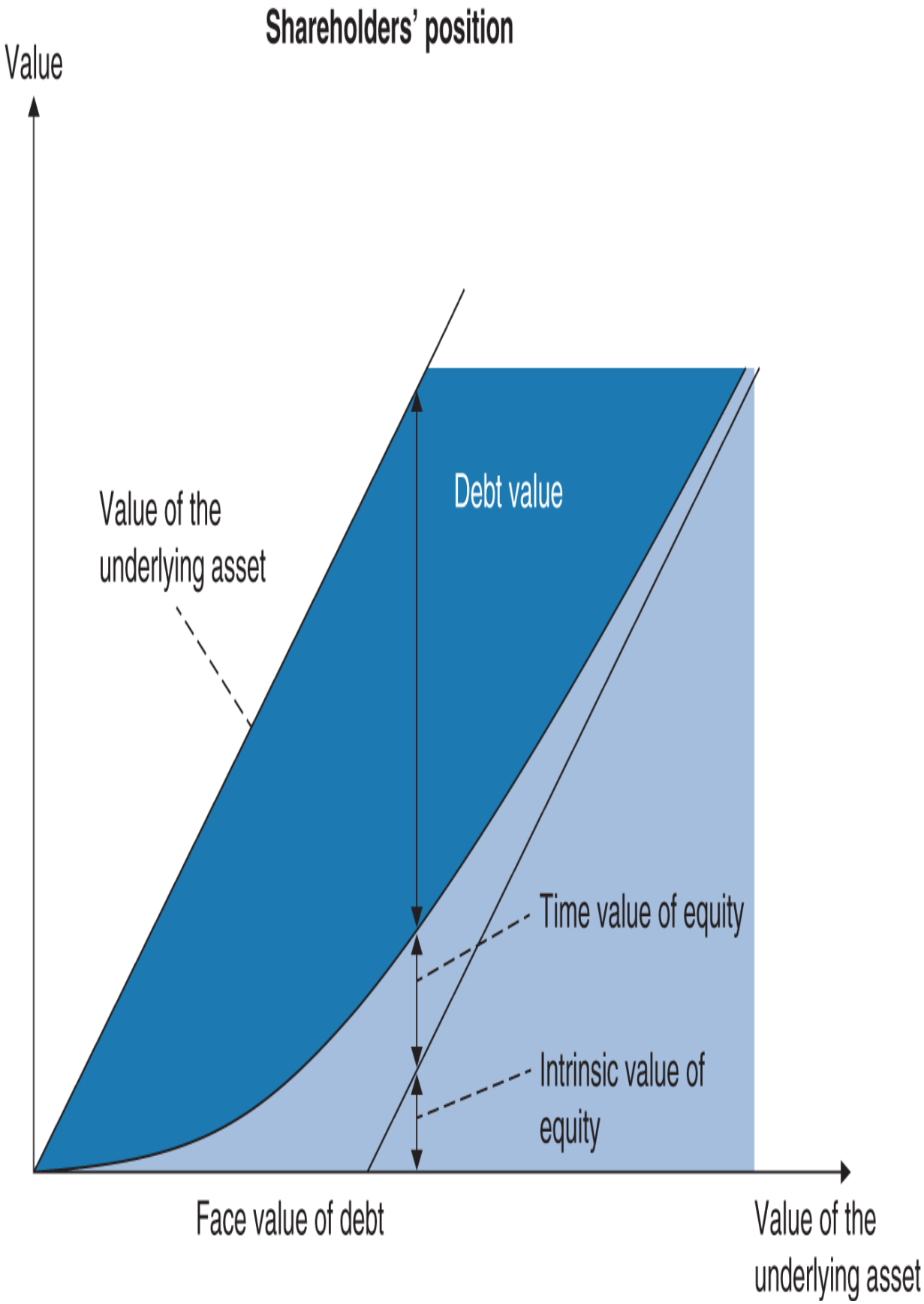
If the debt were to mature today, the shareholders would exercise their put option since operating assets are worth only 70 while the outstanding debt is 80. The company would have to file for bankruptcy. Fortunately, the debt is not redeemable today but only in, say, two years' time. By then, the enterprise value, i.e. the value of operating assets, may have risen to over 80. In that case, equity will have an intrinsic value equal to the difference between the enterprise value at the redemption date and the amount to be redeemed (in our case, 80).

Today, however, the intrinsic value of equity is zero (it cannot be negative as seen in Section 23.3) and the present value of equity (8) can only be explained by its time value. It represents the hope that, when the debt matures two years hence, enterprise value will have risen enough to exceed the amount of debt to be repaid, giving the equity an intrinsic value.

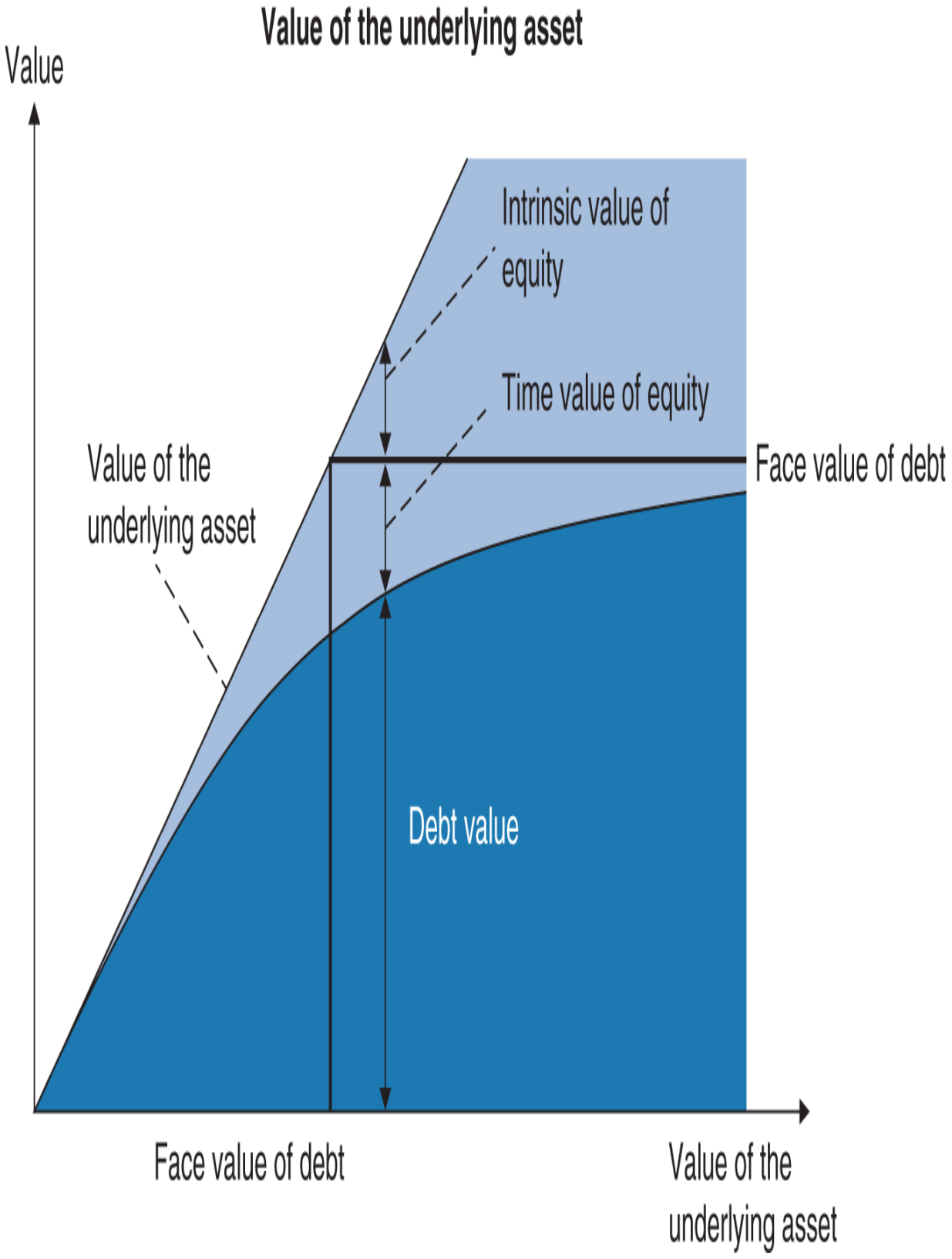
As seen in the following graphs, a company's financial position can be considered from either the shareholders' or the creditors' standpoint.


Decomposition of the underlying asset value
Intrinsic value of equity
Intrinsic value of equity
Equity value
Underlying asset value
Time value of equity
Value of put option on assets
Debt value discounted at risk free rate
Face value of debt
Debt value
Debt value
Shareholders' position

Decomposition of the enterprise value.


Shareholders' position
Value
Value of the underlying asset
Debt value
Time value of equity
Intrinsic value of equity
Face value of debt
Value of the underlying asset

Shareholders' position.



Debtholders' position.

By now you must (might) be eager to apply your new-found knowledge of options to corporate finance!

The time value of an option increases with the volatility of the underlying asset.

The more economic or industrial risk on a company, the higher the volatility of its operating assets and the higher the time value of its equity.

The options method is thus theoretically relevant to value large, risky projects financed by debt, such as oil drilling in northern Siberia, leisure parks, etc., or those with inherent volatility, such as biotech start-ups.

The time value of an option depends on the position of the strike price relative to the market value of the underlying asset.

When the call option is out-of-the-money (enterprise value lower than outstanding debt), the company's equity has only time value. Shareholders hope for an improvement in the company, whose equity has no intrinsic value.

When the call option is at-the-money (enterprise value equal to debt at maturity), the time value of equity is at its highest and anything can happen. Using the options method to value equity is now particularly relevant, since it can quantify shareholders' anticipation.

When call option is in-the-money (enterprise value higher than outstanding debt at maturity), the intrinsic value of equity quickly outweighs the time value. The risk on the debt held by the lenders decreases and becomes nearly non-existent when the enterprise value tends towards infinity. This brings us back to the traditional idea that the higher the enterprise value, the less risk creditors have of a default, and the more the cost of debt approaches the risk-free rate.

> Using options theory to analyse liabilities is particularly helpful when a company is in financial distress.

The options method is therefore applied to companies that carry heavy debt or are very risky.

The time value of an option increases with its maturity.

This is why it is so important for companies in distress to reschedule debt payments, preferably at very long maturities.

The example below illustrates the use of options to value equity.

Take a company that has both debt and equity financing and let us assume its debt is 100, redeemable in one year. If, based on its degree of risk, the debt carries 6% interest, then the amount to be paid to creditors one year later is 106.

If the firm's value is 150 at the time of calculation, then the value of equity – defined as the difference between enterprise value and the value of debt – will be 150 − 100 = 50.

What happens if we apply options theory to this value?

We shall assume the risk-free rate is 5%. The discounted value of the debt + interest payment at the risk-free rate is 106 / 1.05, or 100.95.

The value of debt can be expressed as:

Value of debt = Value of debt at the risk-free rate – Value of a put

i.e. the value of the put = 100.95 − 100 = 0.95.

We know that the value of equity breaks down into its intrinsic and time value:

Value of equity	50
− Intrinsic value = 150 − 106	44
= Time value	6

You can see that, for this company with limited risk, the time value measuring the actual risk is far lower than the intrinsic value. Similarly, the value of the put, which acts as a risk premium, is very low as well.

Now, let's increase the risk of operating assets and assume that the interest rate required by the creditors is 15% rather than 6%, corresponding to a 10% risk premium as the risk-free rate is 5%. The amount to be repaid in one year is thus 115.

The value of the debt discounted at the risk-free rate is 115 / 1.05, or 109.52. The value of the put is thus 109.52 − 100 = 9.52.

Note that the risk premium for this company is much higher than in the preceding example, reflecting the increasing probability that the company will default on its debt. This debt is now very similar to a high-yield or non-investment grade debt (see Section 20.6).

The value of equity, which is still 50, breaks down into an intrinsic value of 35 (150 − 115) and a time value of 15 (50 − 35). Since there is more risk than in our previous example, the time value accounts for a higher share of the equity value.

Section 34.3 USING OPTIONS THEORY TO ANALYSE A COMPANY'S FINANCIAL DECISIONS

Options theory helps us understand how major corporate financial decisions (choice of capital structure, dividend payout, investment decisions, etc.) affect shareholders and creditors differently, and how they can result in a transfer of value between the two.

Take the example of a holding company, Holding plc, which owns 100 ordinary shares of Daughter plc, listed at £2,230 per share. We shall assume that the liabilities of Holding plc comprise 100 shares and 300 bonds. Each of the latter is a zero-coupon bond with a redemption value of £1,000 in three years' time. The creditors do not expect any coupon payments or changes in the capital structure before the debt redemption date.

The table below lists the closing prices for a call option on a Daughter plc share at various exercise prices:

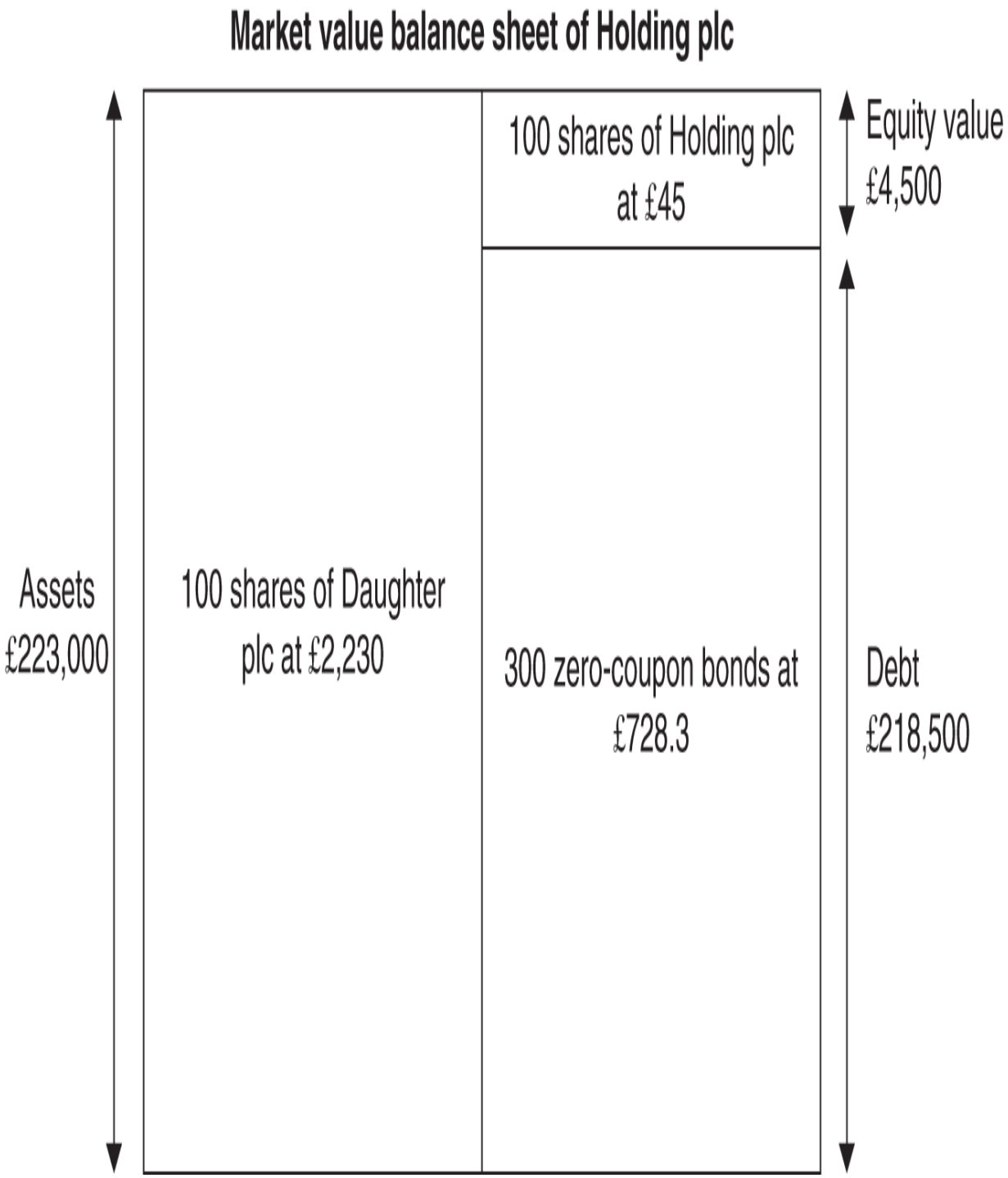
Exercise price (£)	Value of a 3-year call option on Daughter plc (£)
2,600	130
2,800	80
3,000	45
3,200	31

The enterprise value of Holding plc is equal to the number of Daughter plc shares multiplied by their market price, i.e. £223,000.

Consider each of the 100 shares issued by Holding plc as being an option on its operating assets (the shares of Daughter plc), i.e. £223,000, with an exercise price that is equal to the amount of Holding plc debt outstanding, giving 300 bonds × £1,000 = £300,000.

Each Holding plc share can thus be considered to be a call option with an exercise price of £300,000 / 100 shares = £3,000, and a maturity of three years.

According to the table above, Holding plc's equity value is thus £45 × 100 shares = £4,500.



The value of debt is equal to the difference between the enterprise value (£223,000) and that of equity (£4,500), i.e. £218,500.

One bond is therefore worth £728.3 (£218,500 / 300), corresponding to an implied yield of 11.1% (in fact: $728.3 = 1{,}000 / (1 + 0.111)^3$).

We will now discuss a few major financing or investment decisions in a context of **equilibrium** – that is, where the debt, shares and assets held are bought or sold at their fair value, **without the market having anticipated the decision**.

1/ INCREASING DEBT

Suppose the shareholders of Holding plc decide to issue 20 additional bonds and use the proceeds to reduce the company's equity by distributing an exceptional dividend. The overall exercise price corresponding to the redemption value of the debt at maturity is:

$$320 \text{ bonds} \times £1{,}000 = £320{,}000 \text{ or } £3{,}200 \text{ per share}$$

A look at the listed prices of the options shows us that at an exercise price of £3,200, Holding plc's equity is valued as £31 × 100 shares = £3,100, indicating that the value of its debt at the same date is £219,900 (£223,000 − £3,100).

The new bondholders will thus pay £13,744 (20 bonds × £219,900/320 bonds), which will go to reduce the equity of Holding plc.

The shareholders consequently have £13,744 in cash and £3,100 in shares, i.e. a total of £16,844 compared with the previous £4,500. They have gained £12,344 to the detriment of the former creditors, who have seen the value of their claim fall from £218,500 to 300 bonds × £687.19, or £206,156.

Their loss (£218,500 − £206,156 = £12,344) exactly mirrors the shareholders' gain. The implicit yield to maturity has risen to 13.3%, reflecting the fact that the borrowing has become riskier since it now finances a larger share of the same amount of operating assets.

Increasing the risk to creditors has enhanced the value of the shares, thereby reducing that of the bonds. The existing creditors have lost out because they were not able to anticipate the change in corporate structure and have been harmed by the dividend distribution.

Common (accounting) sense seems to indicate that distributing £13,744 in cash to shareholders should translate into an equivalent decrease in the value of their Holding plc shares. According to this reasoning, after the

buy-back the Holding plc shares should have been revalued at −£9,244 (£4,500 − £13,744), but that cannot be!

Options theory solves this apparent paradox. It shows that when new debt is issued to reduce equity, the time value of the shares decreases less than the amount received by shareholders and remains positive. True, the likelihood that the value of Daughter plc shares will be higher than that of the redeemable debt upon maturity has lessened (since debt has increased), but it is still not nil, giving a time value that, while lower, is still positive.

Of course, this example is exaggerated. Such a decision would have catastrophic consequences for shareholders, who would be taken to court by the creditors and lose all credibility in the eyes of the market. But it effectively illustrates the contribution of options theory to equity valuations.

Increasing debt increases the value of shareholders' investment, to the detriment of the claims held by existing creditors. Thus, value is transferred from creditors to shareholders.

Conversely, when debt is reduced by a capital increase, the overall value of shares does not increase by the value of the shares issued. The old debt, which has become less risky, has, in fact, “confiscated” some of the value, to the benefit of creditors and the detriment of shareholders.

2/ THE INVESTMENT DECISION

Now let us return to our initial scenario and assume that Holding plc manages to exchange the 100 shares of Daughter plc for 100 shares of a company with a higher risk profile called Risk plc, for £223,000 (100 × £2,230).

Each share of Holding plc is equal to a call option on a Risk plc share with an exercise price of £3,000 (300 × £1,000/100).

Suppose the value of a call option on a Risk plc share is £140 with an exercise price of £3,000 and an exercise date in three years' time.

The Holding plc shares are consequently worth £14,000.

Exchanging a low-risk asset (Daughter plc) for a highly volatile asset (Risk plc) has redistributed value to the benefit of shareholders, whose gain is £9,500 (£14,000 − £4,500).

Their gain exactly mirrors an equivalent loss to creditors, since the value of the debt has fallen from £218,500 to £223,000 − £14,000 = £209,000, i.e. a £9,500 decline.

The higher risk led to an increase in the implicit yield to maturity of the bonds from 11.1% to 12.8%.

As in our previous examples, the transfer of value was only possible because creditors underestimated the power shareholders have over the company's investment decisions.

3/ RENEGOTIATING THE TERMS OF DEBT

What if we now return to our initial situation and imagine that the company is able to reschedule its debt? This happens when creditors prefer to let a company in financial distress attempt a turnaround rather than precipitate its demise.

So let's assume the debt is due in four years, rather than the initial three years. A look at our options price list for Daughter plc shares with a four-year maturity shows us that they carry a higher premium.

Exercise price (£)	Value of put on Daughter plc shares in 4 years (£)
2,600	140 (versus 130)
2,800	89 (versus 80)
3,000	53 (versus 45)
3,200	40 (versus 31)

This, of course, comes as no surprise to our attentive readers who remember learning in Chapter 23 that the value of an option increases with the length of its life.

The value of equity is thus £53 × 100 shares = £5,300. A bond is therefore worth £725.7 ((£223,000 − £5,300) / 300). Without having abandoned any flows, creditors' generosity will have cost them £800.[2]

4/ OTHER PRACTICAL APPLICATIONS

As our readers may have understood, shareholders' equity is effectively only valued using the option models for distressed companies.

These theoretical developments have been the basis for the creation of models to assess the default risk of the firm. In particular, the consulting company KMV has developed well-known models from the work of Merton, Black and Scholes. Such models have been greatly developed by banks. The volatility of operating assets is a fundamental input to these models. As we have seen, a company with highly volatile operating assets has a high probability of bankruptcy. Unfortunately, volatility in the value of operating assets is not directly measurable in the markets. However, through the reasoning we have applied throughout this section, the market value of equity is used to determine the implied volatility of its operating asset.

Hedge funds have developed arbitrage strategies between debt and equity markets (capital structure arbitrage) based on this approach. These techniques use mainly credit default swaps (CDSs). Lastly, some borrowers hedge their credit risk by selling shares of the firm short. In doing so, they earn on one side what they may lose on the drop in value of their loan.

Section 34.4 RESOLVING CONFLICTS BETWEEN SHAREHOLDERS AND CREDITORS

Creditors have a number of means at their disposal to protect themselves and overcome the asymmetry from which they suffer. They can be grouped under two main headings:

hybrid financial securities;

restrictive covenants.

1/ HYBRID FINANCIAL SECURITIES

Hybrid financial securities, combining features of both debt and equity – such as convertible bonds, bonds with equity warrants, participating loan stock, hybrid bonds of indefinite maturity, etc. – would not be necessary in a perfect market.

In fact, should shareholders make investment or financing decisions that are detrimental to creditors, the latter can exercise their warrants or convert their bonds into shares, thus becoming shareholders themselves and, if all goes well, recouping in equity what they have lost in debt!

Jensen and Meckling (1976) have demonstrated that the issue of convertible bonds reduces the risk of the firm's assets being replaced by more risky assets that increase volatility and thus the value of the shares. The same reasoning is applied when “free” warrants are granted to creditors who agree to waive some of their claims during a corporate restructuring plan (see Chapter 24).

2/ RESTRICTIVE COVENANTS

> Covenants are commitments to do or not do. If the firm does not meet these covenants, debt becomes due immediately.

Covenants act like an atomic bomb, whose purpose lies in convincing shareholders not to take decisions that would result in transferring value

from lenders to themselves. Like an atomic bomb, the aim is not to trigger it but rather to incite parties to negotiate.

In practice, when a company does not meet its covenants, banks generally agree either to grant a delay to restore the situation (covenant holiday) or to change the covenants to make them less constraining (covenant “reset”), in exchange for additional compensation (waiver fee) and/or an increased interest.

Covenants are analysed in more detail in Chapter 39.

Section 34.5 ANALYSING THE FIRM'S LIQUIDITY

In most cases, the company pays off part of its debt with its free cash flows and refinances the balance of its debt by taking out a new loan. Most of the time, the sum of free cash flows is higher than the amount of debt to be repaid, but the flows generally are further off in time than the due date for the debt, and can be insufficient in the short term. The duration (see Chapter 20) of cash flows is generally longer than the duration of debt flows, which rarely exceed six to seven years.

The firm is then exposed to a double risk:

the risk of the interest rate at which it will refinance part of its current debt in the future;

a liquidity risk since, at the time the firm has to take out a new loan, market conditions may not allow it to if there is a major liquidity crisis under way (as was the case in late 2008/early 2009).

It is possible to hedge against these two risks, as we shall see in Chapter 51. Frequently, however, the liquidity risk is unhedged, either because it is not always possible to hedge against it, or because the cost of hedging is seen as prohibitive, or possibly because severe liquidity crises are so rare that it is not deemed necessary to hedge against this risk.

The difference between the duration of a firm's free cash flows and the duration of its debt (often a shorter period) constitutes an asset liability refinancing gap (ALRG). Aït-Mokhtar (2008) has shown that it is the same as a liability for a firm, as if it had entered into an interest rates swap (see Section 51.3) in which it pays the floating interest rate and receives the fixed rate. On maturity of its debt, the firm will only be able to make the repayment if it is able to find lenders that are prepared to lend to it, since the free cash flows it receives will be insufficient to pay off the whole of the debt. So, what it has done is undertaken to contract future debt at an unknown interest rate in order to continue its activity (hence the swap's leg with a variable rate payment which corresponds to the interest rate of the future loan). In normal times, this liability is worth a negligible amount as it is reasonable to expect that a healthy firm will have no problems in

refinancing in the future. But in the event of a liquidity crisis and for firms with imminent debt repayment deadlines (a few months or quarters), this ALRG has a very high value. It is equal to the existing uncertainty as to the possibility of the company being able to find the necessary financing.

So we can say:

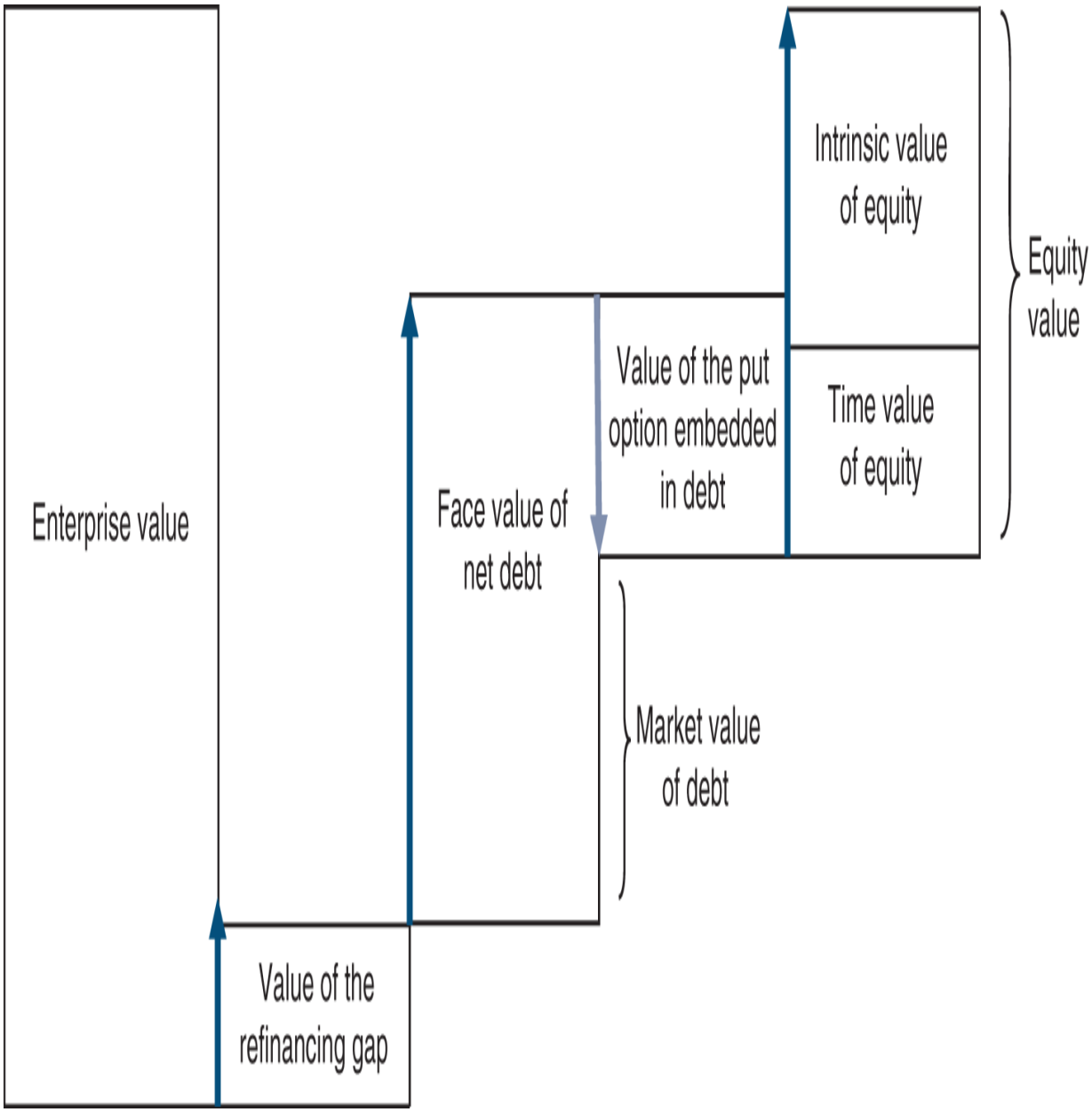
Value of operating assets (i.e. enterprise value)

– Value of net debt

– Value of ALRG

= Value of equity capital

Which corresponds to:



When investors start to worry about the ability of the company to refinance in the near future, the value of the ALRG increases, pushing down the value of equity. And the phenomenon can pick up speed if the current lenders try and hedge their risks by selling short the firm's shares, hoping to gain on this short-selling what they will lose as a result of the decline in the value of their debt.

When the firm is able to find refinancing for its debt, for example through a share issue, we see in some cases (Europcar in 2021) an increase in the share price, which contradicts what we have seen up to now. On the one

hand, the value of the share is negatively impacted by the transfer of value to the creditors, but on the other hand, it benefits fully from the disappearance of the ALRG. And if the latter were worth more than the discount on the debt, the net impact would be positive and the value of the share would rise.

Section 34.6 CONCLUSION

The concept of time value for equity is the main added value of the application of option theory to corporate finance.

Keep in mind that:

Leveraging a company either to distribute dividends, to reduce capital or to invest tends to increase the risk to creditors, transferring value from them to shareholders. The value of the shares diminishes less than the dividend payout and increases when the debt is used for investment or share buy-back purposes.

Similarly, replacing non-risky assets with risky assets does not change enterprise value, but it does transfer value from creditors to shareholders.

Lastly, rescheduling debt transfers value from creditors to shareholders.

This is called the expropriation effect, where some of the value of the claims is confiscated without any exchange of flows.

We are now quite far away from the simple book leverage effect that seemed to prove that shareholders could create value by investing funds at a higher rate than the interest rate. The relationship between shareholders and lenders is in practice quite different. Their interests can actually diverge significantly due to a change in the risk profile of the firm, even if there are no cash flow exchanges between them and the enterprise value remains constant.

We hope that our readers will have understood the importance of reasoning in value terms and now have the reflex of assessing any financial decision not only in terms of return, but also risk. The use of options may have been overwhelming. We hope so, as readers will now always remember to assess risk and value transfers in financial decisions.

SUMMARY

The summary of this chapter can be downloaded from www.vernimmen.com.

The status of the creditor differs radically from that of the shareholder. The shareholder stands to gain a potentially unlimited amount and their risk is limited to their investment, while the creditor, who can also lose their investment, can only expect a fixed return.

This asymmetry brings options to mind. This chapter showed that there is more than one similarity.

The shareholders' equity of a levered company can be seen as a call option granted by creditors to shareholders on the company's operating assets. The strike price is the value of the debt and the maturity is the date on which the debt is payable. When the debt falls due, if the value of the operating assets is higher than the amount of the debt to be repaid, the shareholders exercise their call option on the operating assets and pay the creditors the amount of the debt outstanding. If, however, the value of the operating assets is lower than the amount of the debt to be repaid, the shareholders decline to pay off the debt and the creditors appropriate the operating assets.

Similarly, we can show that lending to a company is a means of investing in its assets at no risk. The lender sells the shareholders a put option at a strike price that is equal to the debt to be repaid.

Using this options-based approach, we can break down the value of equity into intrinsic value and time value. Intrinsic value is the difference between the present value of operating assets and the debt to be repaid upon maturity. Time value is the hope that when the debt matures, enterprise value will have risen to exceed the amount of the debt to be repaid.

This leads to a better understanding of the impact of certain decisions on the financial situation of creditors and shareholders:

a dividend payout financed by the sale of assets or a debt increase will increase creditors' risk, reduce the value of the debt owed to them and, at the same time, increase the value of shareholders' equity;

investing in high-risk projects (but for which the net value at the required rate of return is nil) does not result in an immediate change in enterprise value, but increases creditors' risk, reduces the value of debt and increases the value of shareholders' equity by the same amount;

by financing its own investments (or carrying out a capital increase), the company increases enterprise value by this amount (if the return on the investment is equal to the required rate of return). Part of this additional value will go to the creditors, whose risk is reduced, to the detriment of shareholders, as the overall value of their shares will not rise by the amount of the funds invested or the capital increase.

All financial decisions must be examined from an overall point of view, but also in terms of the creation or destruction of value for the various stakeholders. A given financial decision could be neutral in terms of overall value, but could enhance the value of some financial securities at the expense of others.

QUESTIONS

1/When making a comparison with options, what does shareholders' equity correspond to?

2/When making a comparison with options, what does a credit risk correspond to?

3/For what type of company can we apply the options theory for the valuation of shareholders' equity?

4/According to this theory, can the value of a company's equity be nil?

5/Why is the application of this theory more efficient for companies in difficulty?

6/Is this view of the company opposed to the theory of markets in equilibrium?

7/Give an example of a decision where creditors are “expropriated” by shareholders, without the debt agreement being renegotiated. Explain.

8/Is the effect of expropriation a result of market inefficiency?

9/A company is in trouble as a result of low profits and excessive debts.

Do you think that the creditors and the shareholders have the same concerns? More specifically, in the event of the following:

massive new investments carrying a very high risk but that will possibly lead to high returns which will enable the company to get back on its feet with a low level of profits;

an increase in debt;

an increase in shareholders' equity.

Would your answer be different if the company were profitable and carrying very little debt?

What financial product do these examples of creditor–shareholder relationships bring to mind?

10/Can you give an example of a kind of company where shareholders' equity is made up of pure time value?

11/If lenders are seeking to hedge their loan, should the impact be positive or negative on the share price of the borrower?

More questions are waiting for you at www.vernimmen.com.

EXERCISES

1/The investment firm Verfinance owns 5,000 shares in Uninet, a group involved in the maintenance products sector, worth 10m. This asset is financed by a five-year zero-coupon bond (issued today) whose redemption value is 6m, and by equity for the balance.

The following table relating to the Uninet share appears in the financial press in the section on European call options:

Strike price	5-year option	7-year option
1,200	1,010	1,085
1,600	731	832
2,000	510	627
2,400	348	468

Does the above table seem consistent to you?

Can you value the shareholders' equity and the debt of Verfinance with the data you have?

What could you do to increase the value of the company's shareholders' equity? Make several suggestions. Which would seem to be the most realistic to you? Why? Would you be creating value? Why? All in all, have you created value or transferred value?

2/Companies A and B each have to pay 100 to their creditors in one year. The risk-free rate is 5% per year. Below are the key figures for companies A and B, before and after a capital increase of 50 that they are planning for the purpose of financing new investments:

	A		B	
	Before	**After**	**Before**	**After**
Value of operating assets	100	150	100	150
Volatility of operating assets	10%	10%	40%	40%
Equity value	7	?	18	?
Value of debt	93	95.1	82	92.1
Implicit interest rate on debt	7.5%	5.2%	22%	8.6%

What is the equity value of A and B after the capital increase? Show that it is not in the interests of the shareholders of A or B to carry out a capital increase to finance investments. Does the capital increase create value? Show that, nevertheless, shareholders' wealth is increased. Do you think that the creditors would agree to finance new investments? Why? How do you explain this paradox?

3/Take the figures for Holding plc (Section 34.3) and assume that the shareholders in the company decide to pay out a cash dividend of £13,380 totally financed by the sale of 63 shares in Daughter plc (£13,380 / £2,230).

What is the new value of Holding plc's equity according to the options theory?

What is the value of Holding plc's debt according to the options theory? What is the yield to maturity?

What is the result of the operation?

ANSWERS

Questions

1/*A call option on the operating assets, the strike price of which is the amount of debt to be repaid.*

2/*The risk-free assets minus a put option, the strike price of which is the amount of debt to be repaid.*

3/*Companies in difficulty and high-risk companies.*

4/*No, because there is always some hope, no matter how little, that the enterprise value will rise before the debt must be repaid, to above the amount to be repaid.*

5/*Because the time value of their equity is higher.*

6/*No, it is not incompatible.*

7/*Investing at a fair price, but in a much more risky venture.*

8/*No, only the lack of anticipation.*

9/

No, better for the shareholder, better for the shareholder, better for the shareholder.

Fundamentally no, but the problem is considerably reduced.

Options.

10/*Companies in distressed situations close to bankruptcy (LatAm, Eramet).*

11/*Negative as this leads them to short sell the stock.*

Exercises

A detailed Excel version of the solutions is available at www.vernimmen.com.

1/

The table is consistent. The higher the strike, the lower the value of the option, the longer the maturity, the higher the price of the option.

The shares can be compared to options on the assets (i.e. the Uninet shares). Strike price = 6m / 5,000 = 1,200, maturity = same as debt = 5 years. Value of these options = 1,010. Value of Verfinance's shareholders' equity = 1,010 × 5,000 = 5.05m. Value of debt = 4.95m.

Capital reduction. "Exchange" Uninet shares for much more volatile shares. There would then be a transfer of value from creditors to shareholders, but no creation of net value.

2/*54.9; 57.9. The capital increase of 50 will only increase the value of shareholders' equity by 47.9 for A and 39.9 for B. The capital increase creates value for the creditors (2.1 for A and 10.1 for B), but destroys the same amount of shareholder value. Accordingly, this is a simple transfer of value. No, because unlike the capital increase, an increase in debt level will reduce the value of the debt.*

3/

Shareholders have a call option on 94 Daughter plc shares (100 − 6) with a strike price of 300,000 (300 bonds × 1,000). This option is equal to 94% of an option of an asset made up of 100 Daughter plc shares (94 / 94%) and the strike price is equal to 319,149 (300,000 / 94%). The new value of shareholders' equity is thus 94% × 31.6 × 100 shares = 2,970. The value of the option (31.6) is calculated by linear interpolation on the basis of the table provided.

The value of the debt will then be 94 × 2,230 × 2,970 = 206,650, a decrease of 11,850. The yield to maturity on the debt rises to 13.3%, which means an increase in the risk on Holding plc's debts.

The shareholders will have 2,970 worth of Holding plc shares and 13,380 in cash (dividends paid), a total of 16,350 compared with 4,500 initially. Their gain of 11,850 (16,350 – 4,500) is made at the expense of the creditors, who lose 218,500 − 206,650 = 11,850.

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NOTES

1 *In reality, it was invented well before, but its generalisation as a company form goes back to the 19th century*.

2 (728.33 – 725.67) × 300 = 800.

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Chapter 35
WORKING OUT DETAILS: THE DESIGN OF THE CAPITAL STRUCTURE

Steering a course between Scylla and Charybdis

By way of conclusion to the part on capital structure policy, we would like to reflect once again on the thread that runs throughout this set of chapters: the choice of a source of financing.

We begin by restating for the reader an obvious truth that is too often forgotten: **If the objective is value creation, then the choice of investments is much more important than the choice of capital structure.** Because financial markets are liquid, situations of disequilibrium do not last. Arbitrage inevitably takes place to erase them. For this reason, it is very difficult to create value by issuing securities at a price higher than their value. In contrast, industrial markets are much more viscous. Regulatory, technological and other barriers make arbitrage – building a new plant, launching a rival product, and so on – far slower and harder to implement than on a financial market, where all it takes is a telephone call or an online order.

In other words, a company that has made investments at least as profitable as its providers of funds require will never have insurmountable financing problems. If need be, it can always restructure the liability side of its balance sheet and find new sources of funds. Inversely, a company whose assets are not sufficiently profitable will, sooner or later, have financing problems, even if it initially obtained financing on very favourable terms. How fast its financial position deteriorates will depend simply on the size of its debt.

> Good financing can never make up for a bad investment.

Section 35.1 THE MAJOR CONCEPTS

1/ COST OF A SOURCE OF FINANCING

Several simple ideas can be stated in this context.

> 1. The cost of all sources of financing is given by the risk profile and the required return of the investment. Thus, a cement plant in Russia might require a 15% rate of return, and this will be the case whether it is financed by equity or debt and whether the investor is Russian, Swiss or Indonesian.

The required rate of return is basically independent of the method of financing and the nationality of the investor. It depends solely on the market risk of the investment itself.

This presents the following consequences:

it is generally not possible to link the financing to the investment;

no “portfolio effect” can reduce this cost;

only the bearing of systematic risk will be rewarded.

It is therefore short-sighted to choose a source of financing based on what it appears to cost. To do so is to forget that all sources of financing will **cost the same, given the risk**.

> 2. For the purpose of managing the liability side of the company's balance sheet, it is a great mistake to take the apparent cost of a source of financing as its true cost.

We have too often heard it said that the cost of a capital increase was low, because the dividend yield on the shares was low, that internal financing costs nothing, that convertible bonds can lower a company's cost of financing, and so on. Statements of this kind confuse the accounting cost with the true financial cost.

A source of financing is a bargain only if, for whatever reason, it brings in more than its market value. A convertible bond can be a good deal for the issuer not because it carries a low coupon rate, but only if the option embedded in it can fetch more than its market value.

Let us dwell briefly on the error one commits by confusing apparent cost and true financial cost.

The difference is minor for debt. It may arise from changes in market interest rates or, more rarely, from changes in default risk. In matters of financial organisation, debt has the merit that its accounting cost is close to its true cost; furthermore, that cost is visible on the books, since interest payments are an accounting expense.

The error is greater for equity, inasmuch as the dividend yield on the share needs to be augmented for prospective growth in dividends.

The error is extreme for internal financing, where, as we have seen and will see in Chapter 36, the apparent cost of reinvested cash flow is nil.

The error is hard to evaluate for all forms of hybrid securities – and this is often the explanation for their success. But let the reader beware: the fact that such securities carry low yields does not mean their financial cost is low. As we have shown in the foregoing chapters, an analysis of the hybrid security using both present value and option valuation techniques is needed to identify the true cost of this financing source.

3. When it comes to a company's financing policy, the immediate direct consequences of its sources of financing cannot be neglected.

Debt, by virtue of the liability that it represents for timely payments of interest and principal, has a direct consequence on the company's cash flow. Debt can plunge the company into the ditch if it runs into difficulties; on the other hand, it can turn out to be a turbocharger that enables the company to take off at high speed if it is successful.

Source	Instrument	Theoretical cost to be used in investment valuation	Cost according to financial theory (A)	Apparent or explicit cost (accountability, cash flow) (B)	Difference (A) – (B)	Determinants of the difference
Debt			Market rate at which the company can refinance	Nominal rate	Small	Evolution of market interest rates; evolution of default risk
Equity	Share issue		Expected return required by the market on shares with the same risk profile	Nil in income statement; apparent cost measured by the dividend yield	Significant	Expected dividend growth rate

Source	Instrument	Theoretical cost to be used in investment valuation	Cost according to financial theory (A)	Apparent or explicit cost (accountability, cash flow) (B)	Difference (A) – (B)	Determinants of the difference
	Self-financing	The same for all products, it is a function of the systematic (non-diversifiable) risk of the investment being analysed	Expected return required by the market on shares with the same risk profile	Nil in the income statement; no apparent cost	Very significant	Total absence of apparent cost
Hybrid products	Convertible bonds, Bonds with warrants attached		Yield to maturity + value of the conversion option	Nominal interest rate (partially restated according to IFRS)	Medium	Value of conversion option
	Preference shares		Return should be slightly lower than the ordinary shares	Higher than ordinary shares and fixed throughout the life of the instrument	Small	They are shares for which a part of the value is guaranteed (present value of fixed dividends)
	Hybrid bond		Rate higher than the cost of a plain vanilla debt	Nominal interest rate	Difficult to evaluate	Variability used for the subordination clause

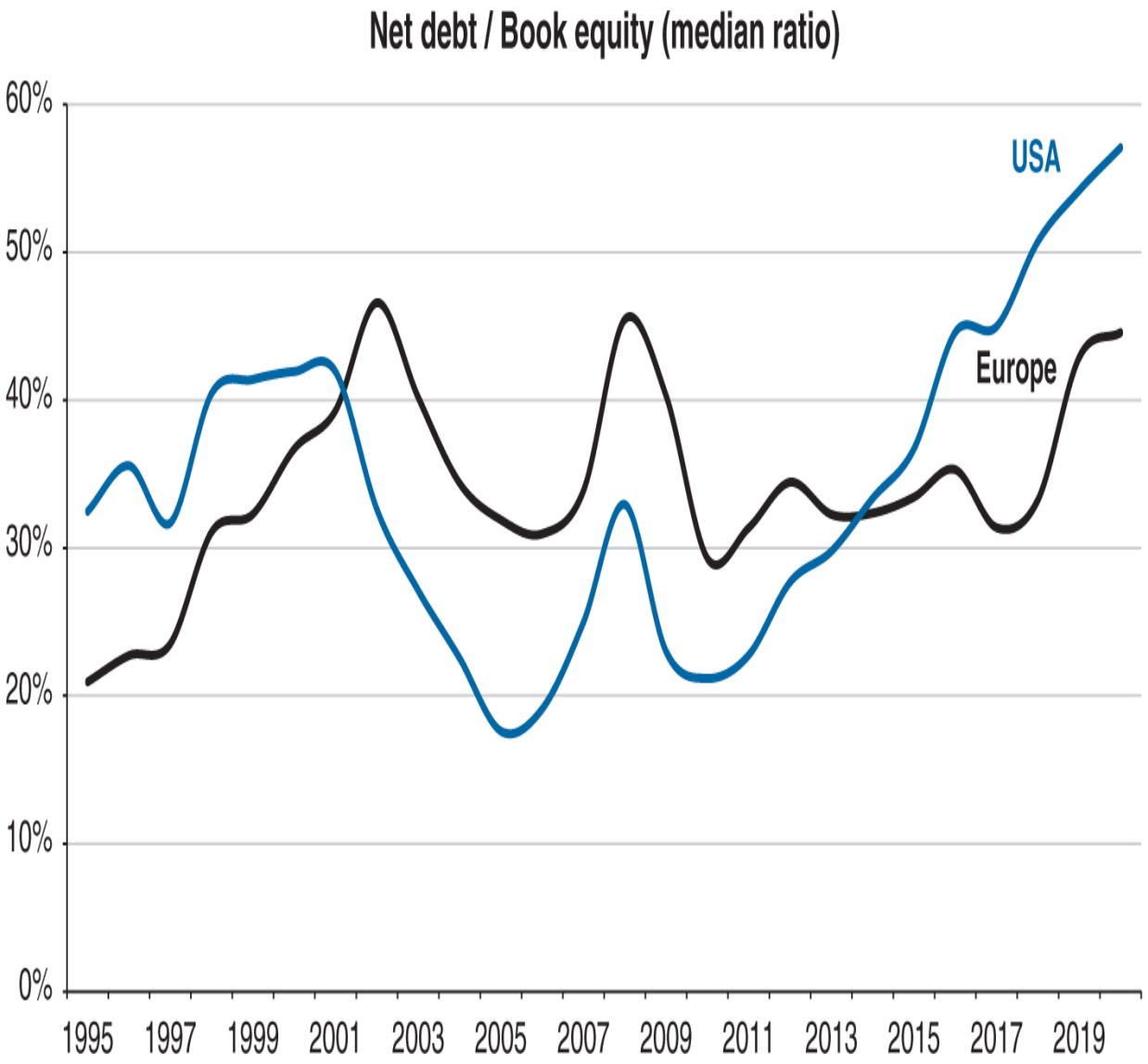
If a company is successful, the cost of a share issue will appear to be much higher, as the company will pay out much higher dividends than they initially expected. They will notice, looking backwards, that the issuance price of the share was very cheap. On the contrary, if the firm is in financial distress, the cost of the share issue will be close to nil, as the

company will not be able to pay the expected dividends. The same is rarely true for debt, as it only occurs if the firm's financial distress leads debtholders to forgive part of their loans.

2/ IS THERE A “ONCE-AND-FOR-ALL” OPTIMAL CAPITAL STRUCTURE?

The answer is clear: no, the optimal capital structure is a firm-specific policy and changes across time.

At the same time, there are a few loose ideas on the subject that the reader will have absorbed. Otherwise, how could one explain why the notion of what constitutes a “good” or “balanced” capital structure should have “changed” so much, and so often, over the course of time?



Large groups on both side of the Atlantic are rarely leveraged as being generally very profitable (which explains their size), they do not need debt.

Source: Data from Factset- Eurostoxx 600 et S&P 500

In the 1980s, a good capital structure was characterised by gradual diminution of debt, improved profitability and heightened reliance on internal financing.

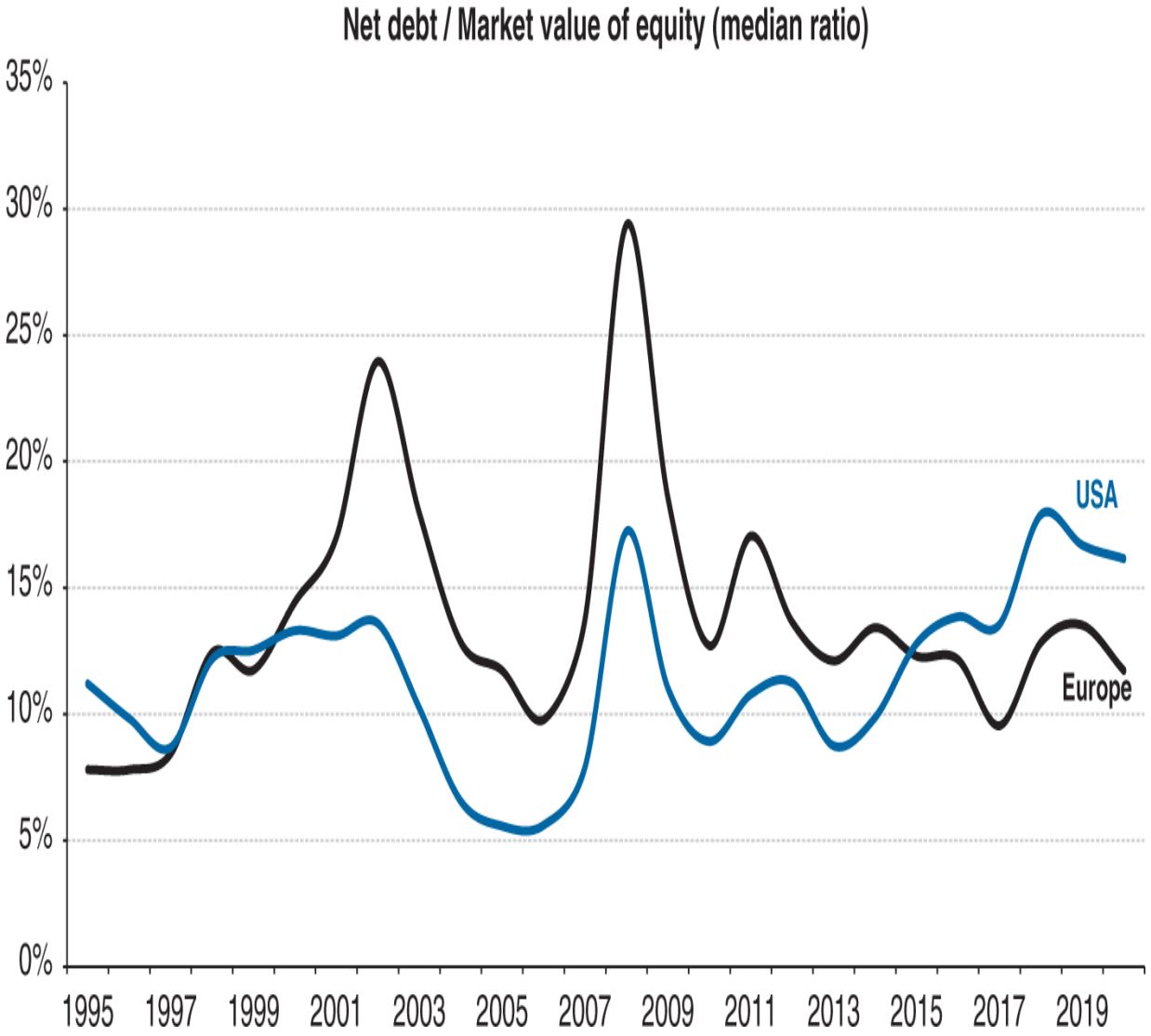
In the early 1990s, in an environment of low investment and high real interest rates, there was no longer a choice: being in debt was not an option. Share buy-backs appear in Europe.

In the late 1990s, though, debt was back in favour if used either to finance acquisitions or to reduce equity. The reason: nominal interest rates were at their lowest level in 30 years.

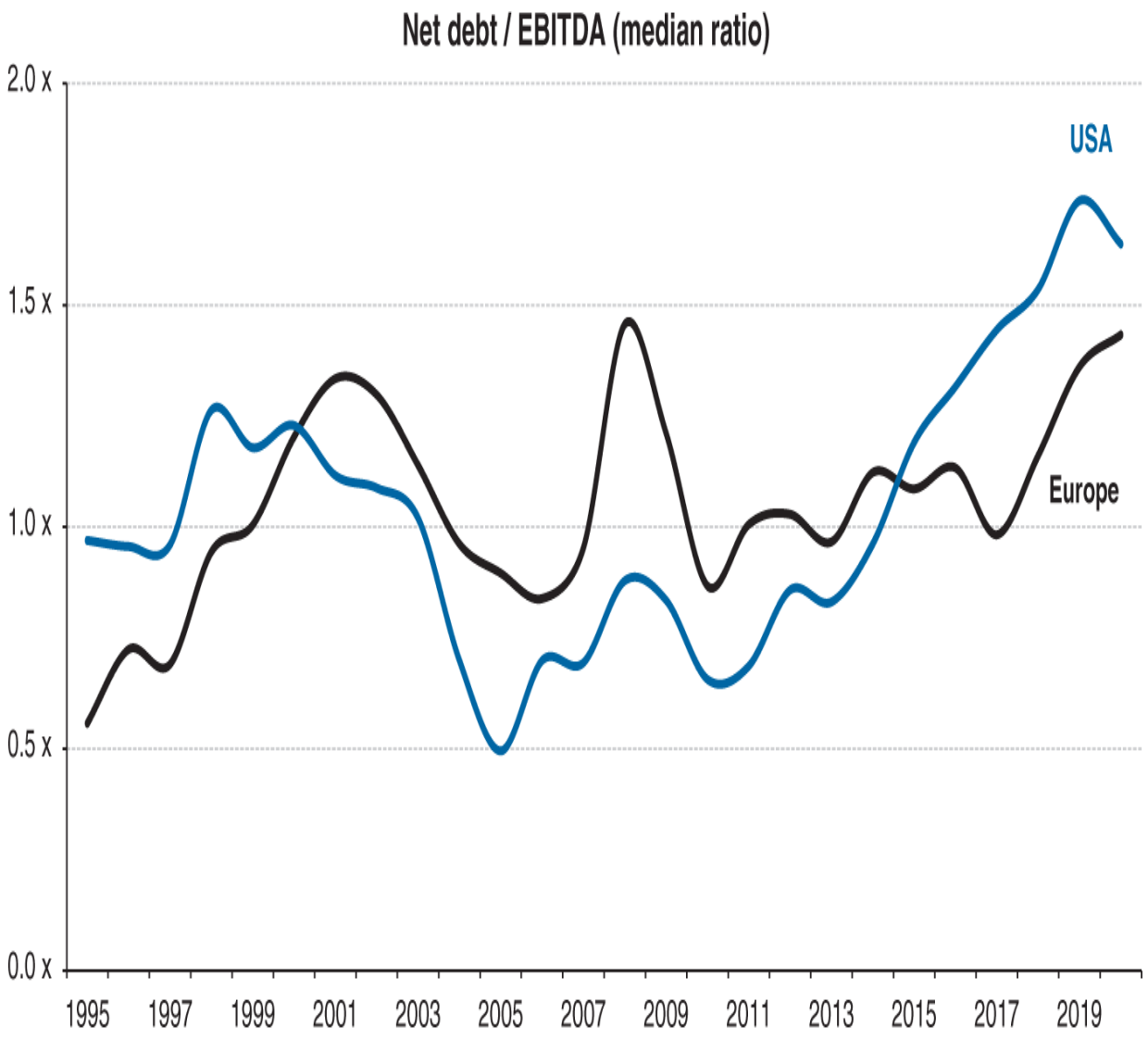
The 2000s started with a financial crisis (the bursting of the Internet bubble) followed by an economic crisis that led to a closure of financial markets. This prevented firms from rebalancing their financial structure towards more equity. The lesson was learnt, as when the second economic crisis of the decade arrived in 2007–2008, corporates were lowly geared, except for groups involved in leveraged buyouts who suffered first. In all sectors, firms were trying to lower their debt level (by lowering capex and reducing working capital) to maintain flexibility as the timing of the upturn remained uncertain.

In the middle of the 2010s, companies that built up cash reserves resumed share buy-back operations or distributed large dividends, sometimes even going back to external growth operations.

With the Covid-19 crisis in 2020 forcing companies to react very quickly, losses from confinements are financed in the first instance by available cash or debt, which weighs on the financial structure in many sectors. Share issues will certainly come at a later stage.



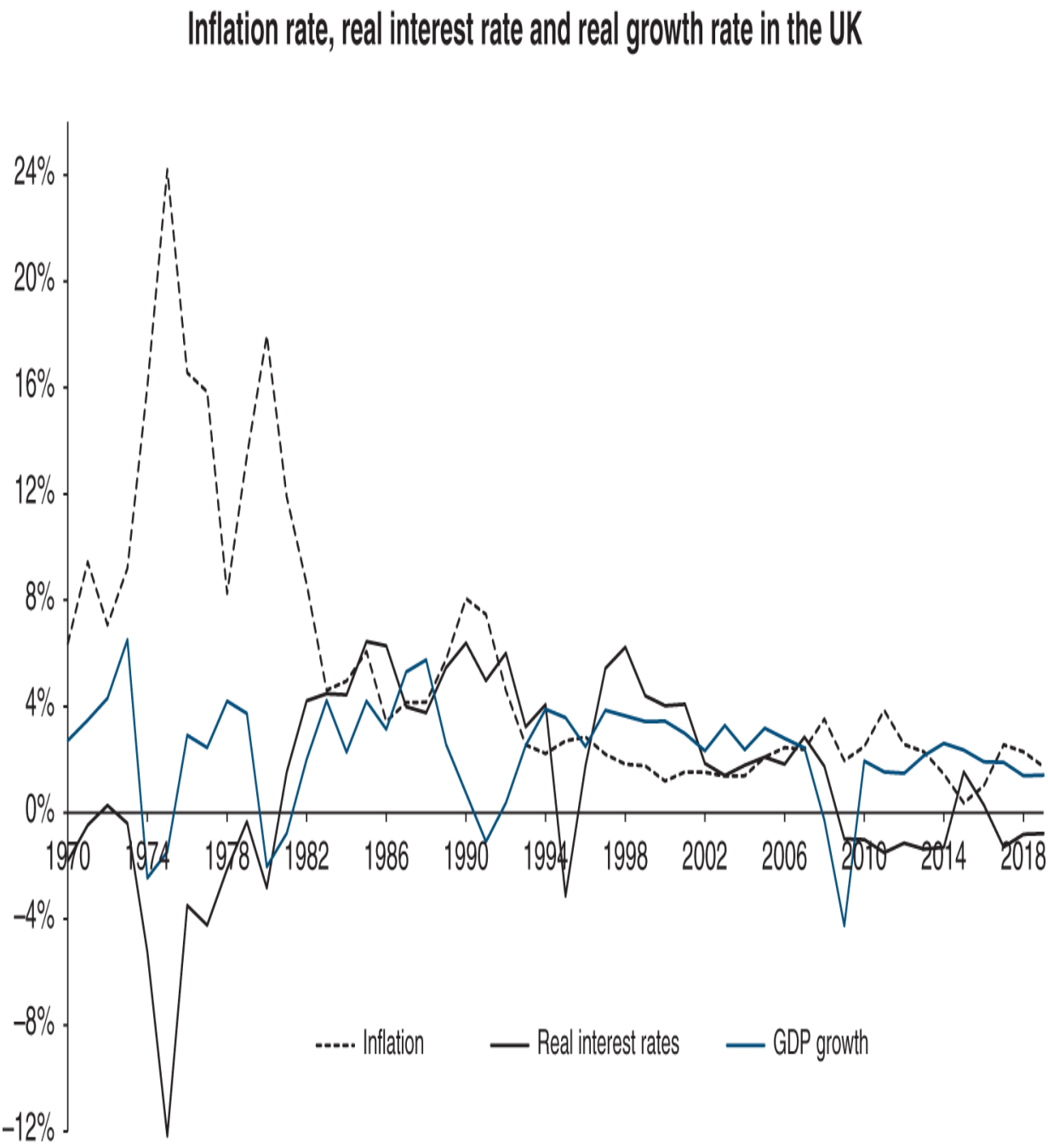
Source: Data from Factset- Eurostoxx 600 et S&P 500



Source: Data from Factset- Eurostoxx 600 et S&P 500

3/ CAPITAL STRUCTURE, INFLATION AND GROWTH

Because inflation is always a disequilibrium phenomenon, it is quite difficult to analyse from a financial standpoint. We can observe, however, that during a period of inflation, of high-volume growth, and negative real interest rates, overinvestment and excessive borrowing lead to a general degradation of capital structures. For companies that invest and reap the benefit of inflated profits, adjusted for inflation, their cost of financing is low. Shareholders can benefit from this phenomenon as well: a low rate of return on investment will be offset by the low cost of financing. Chinese groups in the early 2000s are proof of this.



Source: Data from Factset - Eurostoxx 600 and S&P 500

Disinflation leads to exactly the opposite behaviour: high real interest rates encourage companies to get rid of debt, all the more so given that high rates are usually accompanied by anaemic economic activity and a business climate not conducive to borrowing.

A period of negative or zero percent real interest rates as we have seen in Europe since the mid-2010s, due to low nominal interest rates and low inflation, does not necessarily lead to a significant increase in corporate debt. Indeed, the high margins achieved (see Chapter 10) inflate cash flows, and reduce the need for debt. Moreover, the weakness of volume growth,

which explains the ECB's policy of negative or zero interest rates in order to revive it, does not imply heavy capital expenditure that would have to be financed.

> Companies' inclination to take on debt depends a great deal on the real interest rate and the real growth rate of the economy.

4/ WHAT IS EQUITY FOR?

Equity capital thus plays two roles. Its first function is, of course, to finance part of the investment in the business. Another purpose, just as important, though, is to serve as a guarantee to the company's creditors who finance the other part of the investment. For this reason, the cost of equity includes a risk premium.

Hence, equity capital is like an insurance policy (cf. discussion in Chapter 34 of equity as an option): like insurance, equity financing always costs too much until the crisis happens, in which case one is happy to have a lot of it. As we will see later, when a crisis does come, having considerable equity on the balance sheet gives a company time – time to survive and restructure when earnings are depressed, to introduce new products, to seize opportunities for external growth, and so on.

By comparison, a company with considerable debt suffers greatly because it has fixed expenses (interest payments) and fixed maturities (principal repayment) that will drag it down further. In a crisis, the companies with the most leverage are the first to disappear.

It is true also that financing geared towards equity does not lead management to react quickly when a crisis happens… and can sometimes mean that non-performing firms survive for a long time.

Section 35.2 HOW TO CHOOSE A CAPITAL STRUCTURE

A number of researchers have surveyed top executives and finance directors to determine what criteria they use in taking a financing decision. The tax saving on debt does not appear to be an essential criterion in the choice of capital structure, nor is fear of substantial bankruptcy costs. Rather, maintaining flexibility and concern about the impact of financing on the company's credit rating came top of the list.

Even if companies say they have a fairly precise target for the level of their debt, more than half of all finance directors base their choice of financing on preserving **flexibility**. Although some theoreticians and some finance professors emphasise the limitations of EPS dilution as a criterion (it is not automatically synonymous with destruction of value), among practitioners it remains the most important factor in deciding whether or not to undertake a capital increase. This criterion seems to us a bit outmoded, but we will address it nonetheless in a following section.

The reader will by now have grasped that capital structure is the result of complex compromises between the following elements:

need to keep flexibility, i.e. keeping some financing capacity in case positive events (investment opportunities) or negative events (crises) happen;

need to maintain an adequate rating;

lifecycle of the company and the economic characteristics of the company's sector;

risk aversion of shareholders and their wish not to be diluted;

existence of opportunities or constraints on financial markets;

the capital structure of competitors;

and finally the character of management.

1/ FINANCIAL FLEXIBILITY

Having and retaining flexibility is of strong concern to finance directors. They know that the choice of financing is a problem to be evaluated over time, not just at a given moment; a choice today can reduce the spectrum of possibilities for another choice to be made tomorrow.

Thus, taking on debt now will reduce borrowing capacity in the future, when a major investment – perhaps foreseeable, perhaps not – may be needed. If borrowing capacity is used up, the company will have no choice but to raise fresh equity. From time to time, though, the primary market in equities is closed because of depressed share prices (or can be accessed at such high price conditions, as was the case at the end of 2008, that most issuers are discouraged from tapping this market). If this should be the case when the company needs funds, it may have to forego the investment.

True, the markets for high-yield debt securities react as the equity markets do and may at times be closed to new issues or, equally, require such high interest rates that they are de facto closed.

> Debt markets are much less closed for business than the equity capital market is during a crisis, even though, in a crisis, credit margins can be very high. This has been clearly demonstrated during the 2020 Covid-19 crisis in which debt markets have remained active all the way through but with higher interest rates.

Raising money today with a share issue, however, does not preclude another capital increase at a later time. Moreover, an equity financing today will increase the borrowing capacity that can be mobilised tomorrow.

> A sharp increase in debt reduces a company's financial flexibility, whereas a share issue increases its borrowing capacity.

The desire to retain flexibility prompts the company to carry less debt than the maximum level it deems bearable, so that it will at all times be in a position to take advantage of unexpected investment opportunities. Here again, we find the option concept applied to corporate finance.

In addition, the CFO will have taken pains to negotiate undrawn lines of credit with the company's bank; to have in hand all the shareholder authorisations needed to issue new debt or equity securities; and to have effective corporate communication on financial matters with rating agencies, financial analysts and investors.

If amounts at stake allow it (i.e. are not to be reduced) to face financial crises that are difficult to forecast (but that appear from time to time, e.g. 1990, 2001, 2008, 2011, 2020), the quest for financial flexibility will require the CFO to open up different capital markets to the company. A company that has already issued securities on the bond market and keeps a dialogue going with bond investors can come back to this market very quickly if an investment opportunity appears.

The proliferation of financing sources – bilateral or syndicated bank loans, securitised receivables, factoring schemes, bonds, convertibles, shares, and so on – allows the company to enhance its financial flexibility even further.

2/ THE RATING OF THE COMPANY

Ratings agencies have clearly gained in importance – especially in Europe – due mostly to the transition from an economy based mostly on banking intermediaries to one where the financial markets are becoming predominant.

Ratings are becoming one of the main concerns of CFOs. Financing, distribution, investment, disposal decisions are thus frequently taken based partly on their rating impact; or, more precisely, decisions having a negative rating impact will be adjusted accordingly.

Some companies even set rating targets (Pepsi, Diageo and Danone, for example). This can seem paradoxical in two ways:

although all financial communication is based on creating shareholder value, companies are much less likely to set share price targets than rating targets;

in setting rating targets, companies have a new objective: that of preserving value for bondholders! This is praiseworthy and, in a financial market context, understandable, but has never been part of the bargain with shareholders.

We see several possible explanations for this paradox:

first of all, a debt rating downgrade is clearly a major event for a group and goes well beyond bondholder information. A downgrade is traumatic and messy and almost always leads to a fall in the share price. So, in seeking to preserve a financial rating, it is also shareholder value that management is protecting, at least in the short term;

a downgrade (in particular losing investment grade status) can sometimes lead to forced debt repayments and consequently liquidity problems;

it can also have an immediate cost if the company has issued a bond with a step-up in the coupon, i.e. a clause stating that the coupon will be increased in the event of a rating downgrade;

a good debt rating guarantees a higher degree of financial flexibility. The higher the rating, the easier it is to tap the bond markets, as transactions are less dependent on market fluctuations.

3/ LIFECYCLE OF THE COMPANY AND THE ECONOMIC CHARACTERISTICS OF THE COMPANY'S SECTOR

A start-up will have a hard time getting any debt financing. It has no past and thus no credit history, and it generally has no tangible assets to pledge as security. The technological environment around it is probably quite unsettled, and its free cash flow is going to be negative for some time. For a lender, the level of specific risk is very high. The start-up consequently has no choice but to seek equity financing.

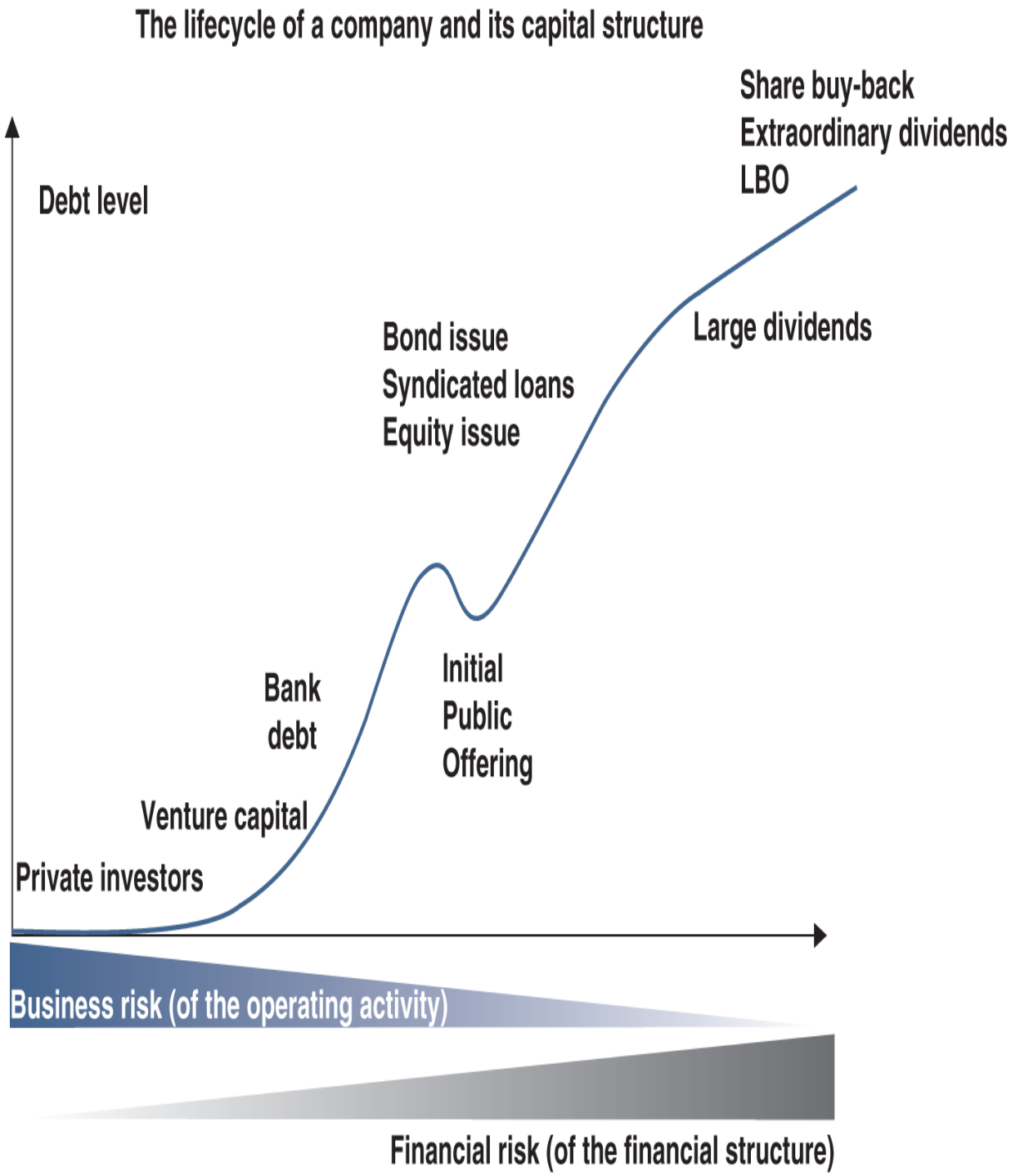
At the other extreme, an established company in a market that has been around for years and is reaching maturity will have no difficulty attracting lenders. Its credit history is there, its assets are real and it is generating free cash flow (predictable with low forecast error), which are all the greater if the major investments have already been made. In short, it has everything a creditor craves. In contrast, an equity investor will find little to be enthusiastic about: not much growth, not much risk, thus not much profitability.

Here we see the lifecycle of financing sources. An industrial venture is initially financed with equity. As the company becomes institutionalised and its risk diminishes, debt financing takes over, freeing up equity capital to be invested in emerging new sectors.

Similarly, in an industry with high fixed costs, a company will seek to finance itself mostly with equity, so as not to pile the fixed costs of debt (interest payments) on top of its fixed operating costs and to reduce its sensitivity to cyclical downswings. But sectors with high fixed costs – steel, cement, paper, energy, semi-conductors, etc. – are generally highly capital-intensive and thus require large investments, inevitably implying borrowing as well.

An industry such as retailing with high variable costs, on the other hand, can make the bet that debt entails, as the fixed costs of borrowing come on top of low fixed operating costs.

Lastly, the nature of the asset can influence the availability of financing to acquire it. A highly specific asset — that is, one with little value outside of a given production process — will be hard to finance with debt. Lenders will fear that if the company goes under, the asset's market value will not be sufficient to pay off their claims.



4/ SHAREHOLDER PREFERENCES

If the company's shareholder base is made up of influential shareholders, majority or minority, their viewpoints will certainly have an impact on financing choices.

Some holders will block share issues that would dilute their stake because they are unable to take up their share of the rights. A company in this situation must then go deeply into debt.

Others may have a marked aversion to debt because they have no desire to increase the level of risk they are bearing (L'Oreal, for example).

> The choice of capital structure is testimony to the level of risk that shareholders are willing to incur.

The most ambitious shareholders will accept both dilution of their control and risk linked to a high level of debt. Their control and the survival of the firm will only be possible thanks to the success of the strategy (Pernod Ricard, for example).

5/ OPPORTUNITIES

Since markets are not systematically in equilibrium, opportunities can arise at a given moment. A steep run-up in share prices will enable a company to undergo a capital increase on the cheap (by selling shares at a very high price). The folly of a bank that says yes to every loan application and the sudden (and temporary!) infatuation of investors for a particular kind of stock (renewable energy companies and electric vehicles in 2020, SPAC (Special Purpose Acquisition Company) listings in 2021), a high volatility together with a limited volume of new issues making the issue of convertible bonds attractive, are other examples.

> Let the reader not be intoxicated by opportunities. It is hard to base a financing policy on a succession of opportunities, which are, by definition, unpredictable. They can happen only on margin.

Furthermore, if the company at some point in time is enjoying exceptionally low-cost financing, investors, for their part, will have made a bad mistake. In their fury, they risk tarnishing the company's image, and it will be a long time before they can be counted on to put up new money. Deliveroo, which went public on the stock market in March 2021, benefiting from Covid frenzy, will surely have raised money at low cost, but will it raise more capital a year later, after its share price still trades 36% below the IPO price? We very much doubt it.

6/ CAPITAL STRUCTURE OF COMPETITORS

To have higher net debt than one's rivals is to bet heavily on the company's future profitability – that is, on the economy, the strategy, and so forth. It is therefore to be more vulnerable to a cyclical downturn, one that could lead to a shake-out in the sector and extinction of the weakest.

Experience shows that business leaders are loath to imperil an industrial strategy by adopting a financing policy substantially different from their competitors'. If they have to take risks, they want them to be industrial or commercial risks, not financial risks.

The choice of capital structure is not absolute but *relative*: the real question is how to finance the business compared with the industry average – that is, compared with the company's competitors.

With the analyses in hand, the person or body taking the financing decision will be able to do so with full knowledge of the facts. The investor will bear in mind that, statistically (and thus for a diversified portfolio), their dream of multiplying their wealth through judicious use of debt will be the nightmare of the company in financial distress. **The financial success of a few tends to make one forget the failure of companies that did not survive because they were too much in debt.**

7/ MANAGERS' CHARACTER

The character of managers will materially influence the capital structure of the firm. Managers averse to risk choose a capital structure with low leverage, whereas those with high self-confidence adopt a highly geared financial structure. Malmendier *et al*. (2011) have shown that managers who experienced the Great Depreciation favour self-financing and are very prudent towards raising debt. There is no doubt that in a few years, other researchers will draw the same conclusions about CFOs who experienced the 2008–2009 financial or the 2020 coronavirus crisis!

This may seem obvious, but it reminds us that choices in corporate finance can be highly subjective; behavioural finance is not to be underestimated.

Section 35.3 EFFECTS OF THE FINANCING CHOICE ON ACCOUNTING AND FINANCIAL CRITERIA

With this description of the key ideas in mind, the time has come for the reader to implement a choice of capital structure as part of a financing plan. To this end, we suggest that the following documents be at hand:

Past financial statements: income statements, balance sheets, cash flow statements.

Forecast financial statements and financing plan, constructed in the same form as past cash flow statements. These can either be mean forecasts or simulations based on several assumptions; the latter strikes us as the better solution. A simulation model will be very useful for establishing the probable future course of the company's capital structure, profitability, business conditions, and so on, given a set of assumptions. This kind of exercise is facilitated by using spreadsheet software and simulation assumptions that allow for a dynamic analysis.

To be fully prepared, the analyst will also want to have sector average ratios, which can be obtained from various industry studies or by calculating them from a sample of listed, comparable companies.

1/ IMPACT ON LIQUIDITY

The liquidity of the company is its ability to meet its financial obligations on time in the ordinary course of business, obtain new sources of financing and thereby ensure balance at all times between its income and expenditure.

In a truly serious financial crisis, companies can no longer obtain the financing they need, no matter how good they are. This is the case in a crash brought on by a panic. It is not possible to protect oneself against this risk, which fortunately is altogether exceptional. The more common liquidity risk occurs when a company is in trouble and can no longer issue securities that financial markets or banks will accept; investors have no confidence in the company at all, regardless of the merit of its investment projects.

Liquidity is therefore related to the term structure of financial resources. It is analysed both at the short-term level and at the level of repayment capacity for medium- and long-term debt. This leads to the use of traditional concepts and ratios that we have already seen: working capital, equity, debt, current assets/current liabilities, and so on.

For analysing the impact on liquidity, the simulation must bear on free cash flow. The analyst will need to simulate different levels of debt and repayment terms and test whether free cash flow is sufficient to pay off the borrowings without having to reschedule them. This is also a method used by rating agencies to determine their rating and by bankers to assess whether they want to lend to a firm or not.

If the company bears a high level of debt, the analyst will consider worst-case scenarios to assess when the liquidity situation will become critical.

2/ IMPACT ON SOLVENCY

Debt increases the company's risk of becoming insolvent. We refer the reader to the development of this topic in Chapter 14.

3/ IMPACT ON EARNINGS

> Other things being equal, debt raises the company's breakeven point.

Indeed, interest payments constitute a fixed cost that cannot be reduced except by renegotiating the terms of the loan or filing for bankruptcy. Take, as an example, a company with fixed costs of 40 and variable costs of 0.5 per unit sold. If the selling price is 1, the breakeven point is 80 units. If the company finances an investment of 50 with debt at 4%, the breakeven point rises to 84 units because fixed costs have increased by 2 (interest expense on the borrowing). If the investment is financed with equity, the breakeven point stays at 80.

The problem is trickier when the interest rate is indexed to market rates, but the interest payments are still a fixed cost in the sense of being independent of the level of activity. Typically, interest rates rise when general economic activity is weakening. In such a case, it is important to test the sensitivity of the company's earnings to changes in interest rates. We have a tendency to forget this in times where interest rates are very low, such as today.

4/ IMPACT ON EARNINGS PER SHARE

An investment financed by debt increases the company's net profit, and thus earnings per share, only if the after-tax return generated by its investments is greater than the after-tax cost of debt. If this is not the case, the company should not make the investment. If an investment is particularly sizeable and long term, it may happen that its rate of return is less than the cost of debt for a period of time, but this must be a temporary situation.

To study these phenomena, companies are accustomed to analysing changes in earnings per share relative to operating profit (EBIT).

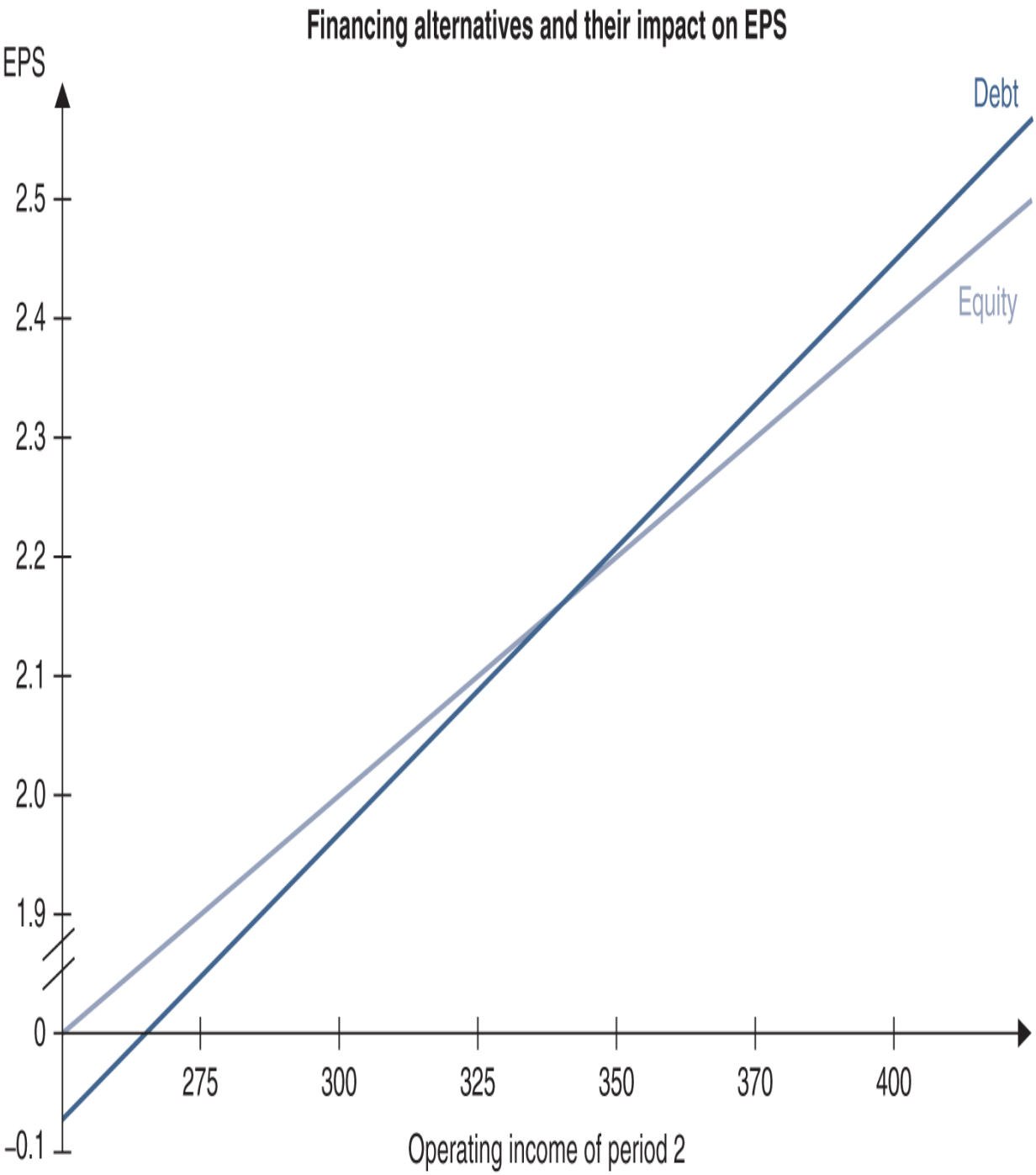
> Consider the example of a company which makes an investment of 200 in period 0 that will become fully operational in period 2. This investment is financed by a call to shareholders (case A) or by borrowing (case B). A simulation of the main parameters of profitability gives the results shown in the table below:

		Period 1		Period 2	
	Period 0	**Case A**	**Case B**	**Case A**	**Case B**
Operating profit (EBIT)	300	300	300	370	370
− Interest expense at 3%	0	0	6	0	6
= Pre-tax profit	300	300	294	370	364
− Income tax at 25%	75	75	74	93	91

		Period 1		Period 2	
	Period 0	**Case A**	**Case B**	**Case A**	**Case B**
= Net profit	225	225	220	277	273
Number of shares	100	120	100	120	100
Earnings per share	2.25	1.88	2.21	2.30	2.73

In period 2, earnings per share will be greater if the investment is financed by debt. In case B, the interest expense reduces EPS, but by less than the dilution due to the capital increase in case A.

This conclusion cannot be generalised, however. The following chart simulates various levels of EPS as a function of operating profit in period 2.



The reader will be able to verify that if operating profit is less than 36, the preceding assertion is reversed. However, a steep decline in earnings (–88%) is required to produce this result. Obviously if the cost of debt was higher the decline would be less.

An investment financed by debt increases EPS in year *N* if the company's marginal return on capital employed in year *N* is greater than the after-tax cost of debt.

An investment financed by equity in year *N* increases EPS in year *N* + 1 if the company's marginal return on capital employed in year *N* + 1 is greater than the reciprocal of P/E in year *N*.

In short: beware! The faster growth of EPS with debt financing is a purely arithmetic result; it does not indicate greater value creation. It is due simply to the leverage effect, the counterpart of which is a higher level of risk to the shareholder.

SUMMARY

The summary of this chapter can be downloaded from www.vernimmen.com.

Whereas frequent disequilibria in industrial markets engender the hope of creating value through judicious investment, the same cannot be said of choosing a source of financing. Financial markets are typically close to equilibrium, and all sources of financing have the same cost to the company given their risk.

The cost of financing to buy an asset is equal to the rate of return required on that asset, regardless of whether the financing is debt or equity and regardless of the nationality of the investor.

It follows that the choice of source of financing is not made on the basis of its cost (since all sources have the same risk-adjusted cost!). Apparent cost must not be confused with financial cost (the true economic cost of a source of financing). The difference between apparent cost and financial cost is low for debt; it is attributable to the possibility of changes in the debt ratio and default risk. The difference is greater for equity owing to growth prospects; greater still for internal financing, where the explicit cost is nil; and difficult to evaluate for all hybrid securities. Lastly, a source of financing is cheap only if it has brought in more than its market value (inefficient markets).

Because there is no optimal capital structure, the choice between debt and equity will depend on a number of considerations:

Macroeconomic conditions. High real (inflation-adjusted) interest rates and low activity growth will prompt companies to deleverage. Inversely, rapid growth and/or low real interest rates will favour borrowing.

The desire to retain a degree of financial flexibility so that any investment opportunities can be quickly seized. To this end, equity financing is preferred because it creates additional borrowing capacity and does not compromise future choices. Inversely, if current borrowing capacity is used up, the only source of financing left is equity; its availability depends on financial markets holding up, which is never certain.

The maturity of the industry and the capital structure of competitors. A start-up will get no financing but equity because of its high specific risk, whereas an established company with sizeable free cash flow but little prospect of growth will be able to finance itself largely by borrowing. Companies in the same business sector often mimic each other (what matters is to be no more foolish than the next guy!).

Shareholder preferences. Some will favour borrowing so as not to be diluted by a capital increase in which they cannot afford to participate. Others will favour equity so as not to increase their risk. It is all a question of risk aversion, financial capacity of shareholders and extent of control.

Financing opportunities. These are, by definition, unpredictable, and it is hard to construct a rigorous financing policy around them. When they occur, they make it possible to raise funds at less than the normal cost – but at the expense of the investors who have deluded themselves.

The reader who performs simulations of the principal financial parameters, differentiating according to whether the company is using debt or equity financing, should be fully aware that such simulations mainly show the consequences of financial leverage:

raising the breakeven point;

accelerating EPS growth;

increasing the rate of return on book equity;

degrading solvency;

affecting liquidity in a way that varies with the term of the debt.

QUESTIONS

1/Can a good financing plan make up for a mediocre investment?

2/What disorder afflicts the investor who mistakes the coupon rate on a convertible bond for its financial cost?

3/A 17% rate of return is required on a certain asset. The acquisition of that asset is financed entirely by equity. What rate of return do shareholders require on it? If the asset were financed entirely by debt, what rate of return would lenders require on it?

4/What is the source of financing for which the difference between financial cost and apparent cost is greatest?

5/Would you advise a start-up to seek debt financing? If yes, could it get it?

6/Is there an optimal capital structure?

7/Equity capital has two roles in a financing plan. What are they?

8/In the final analysis, isn't the cheapest financial resource short-term borrowing?

9/How do you reconcile these two statements:

“You can't make money without borrowing money.”

“Borrowing can't create value.”

10/Will a company with ample growth opportunities tend to issue short-term, medium-term or long-term debt? Why?

11/Give two examples of inflation profits. Under what conditions can they occur?

12/If you believe a finance director's main concern is financial flexibility, would you expect a company ever to use up its borrowing capacity?

13/Is a company destined always to be financed with equity capital?

14/Can an entrepreneur with an industrial strategy be opportunistic in their financing choices over time?

15/Why did European companies rid themselves of so much debt in 1980–1998? Why did they stop doing it in 1998–2002?

16/A hotel group is able to finance itself more easily through debt than a high-tech company. Why?

17/A mineral water company is able to finance itself through debt more easily than a pharmaceutical group. Why?

18/Can an airline company finance itself through debt despite its heavy fixed costs? Why?

19/Why is it that despite real interest rates being zero or close to zero since 2015, European companies are not taking on more debt?

You'll find more questions at www.vernimmen.com.

EXERCISE

1/A company is considering the following:

Year	0	1	2	3	4	5
Cash flow	−100	−10	0	0	10	150

which can be financed with equity:

Year	0	1	2	3	4	5
Debt/equity	30%	22%	22%	22%	22%	22%
EPS	10	8.25	9.1	10.3	11.8	13.6
EPS growth rate		−17.5%	+10%	+13%	+15%	+15%
Rate of return on equity	15%	11%	11%	11.4%	11.6%	12%

or with debt:

Year	0	1	2	3	4	5
Debt/equity	30%	67%	67%	67%	67%	67%
EPS	10	9.3	10.4	12	14.1	16.5
EPS growth rate		−7%	+12%	+15%	+17%	+17%
Rate of return on equity	15%	14%	17%	18%	21%	22%

If the cost of capital is 10%, the shareholder-required rate of return is 12% and the cost of debt is 5%, do you think this investment should be financed with equity or with debt? Isn't there another question that should be asked first?

ANSWERS

Questions

1/*No, because it is very difficult to create value at the level of the financing plan.*

2/*Myopia, because they are not noticing that holders of convertible bonds expect the share price to rise so that they can convert them.*

3/*17%, 17%, as they run the same risk, the risk of operating assets.*

4/*Internal financing, as its apparent cost is nil.*

5/*No, because it would be far too risky for a start-up, requiring certain outflows from uncertain inflows. Probably not until its business model is proved.*

6/*No! We advise our readers who answered 'yes' to read Chapters 32 to 35 again.*

7/*Providing part of the financing and providing security to lenders.*

8/*No, no and no! You forget to take into account the risk (here liquidity risk).*

9/*"You can't make money without borrowing money" applies to an investor with a poorly diversified portfolio; it's all or nothing if they go into debt to leverage it. "Borrowing can't create value" applies to a perfectly diversified portfolio.*

10/*Short-term, so as to be able to refinance on better terms as growth opportunities become profitable investments.*

11/*Inventory profits and opportunity profits on investment realised sooner than expected. Provided the inflation rate is higher than the interest rate.*

12/*No, because the finance director will always want to retain some room to manoeuvre, just in case.*

13/*No, the less risky it becomes, the more readily it can be financed with debt.*

14/*No, because an industrial strategy can't wait for opportunities to arrive.*

15/*High real interest rates and low investment. Because virtually all their debt had already been paid off, they could not go on deleveraging.*

16/*Because it holds assets (the walls of the hotels, business capital) which have a value independent of operations and can be given as collateral for loans. In high technologies, the never-ending changes make cash flow predictions hazardous.*

17/*Because its cash flows are more predictable than those of a pharmaceutical group, the patents of which expire regularly.*

18/*Yes, because it controls two assets which have a value on the secondary market: aircraft and landing rights.*

19/*This is because the margins, and therefore the self-financing capacity, of companies are high (see end of Section 9.1), reducing the need for financing. Moreover, in Europe a firm takes on debt mainly to finance investments, which implies growth in volume. However, this growth remains low, hence why the interest rates are kept very low in the first place by the ECB in an attempt to revive it.*

Exercise

A detailed Excel version of the solution is available at www.vernimmen.com.

1/ *The IRR on the investment is 8%, less than the cost of capital. The investment should not be made; the question of how to finance it is academic.*

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PART TWO
EQUITY CAPITAL

Equity capital policy is of such importance in corporate finance that it must be addressed in depth. The chapters in this part deal, in turn, with dividend policy, share buy-backs and share issues.

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Chapter 36
RETURNING CASH TO SHAREHOLDERS

It's all grist to the mill

Net income has only two possible destinations: either it is reinvested in the business in the form of internal financing or it is redistributed to shareholders in dividends or share buy-backs.

> In pure financial logic, all funds that cannot be reinvested yielding at least the appropriate cost of capital (i.e. the cost of capital that reflects the risk of the project) should be returned, in one form or another, to shareholders.

In fact, when the capital structure of the firm already corresponds to the target fixed by shareholders and management, every cent left in the company in the form of cash will only yield the short-term interest rate, i.e. much less than the cost of equity. Today this may even mean yielding a negative return, given the negative interest rates in certain regions of the world. It is true that the financial risk of the firm is then reduced, but it is not what shareholders are looking for (shareholders theoretically manage financial risks at their portfolio level). In this context, it is very likely that shareholders will value it at less than a cent given its insufficient profitability. After all, shareholders do not need the firm to place cash at the bank. All in all, failure to comply with this rule will most likely lead to value destruction. It also means moving away from the target financial structure defined by the shareholders and management by reducing net indebtedness.

Additionally, the business risk should be financed through equity; otherwise, the firm is likely to face strong liquidity issues at the first downturn. Conversely, a company that has reached economic maturity with a strong strategic position may reduce its equity financing and select a higher gearing. The business cash flows have become sufficiently sound to support the cash requirements of debt.

> Equity exists to support the business risk; therefore it is normal that once this risk is managed, debt takes over in the financing of the firm. The dividend policy is one of the main tools for achieving this objective.

Section 36.1 REINVESTED CASH FLOW AND THE VALUE OF EQUITY

1/ PRINCIPLES

An often-heard precept in finance says that a company ought to fund its development solely through internal financing – that is, by reinvesting its cash flow in the business. This position seemingly corresponds to the interests of both its managers and its creditors, and indirectly to the interests of its shareholders:

For shareholders, reinvesting cash flow in the business ought to translate into an increase in the value of their shares and thus into capital gains on those shares. In virtually all of the world's tax systems, capital gains are taxed less heavily than dividends. Other things being equal, shareholders will prefer to receive their returns in the form of capital gains. They will therefore look favourably on retention rather than distribution of periodic cash flows.

By funding its development exclusively from internal sources, the company has no need to go to the capital markets – that is, to investors in shares or corporate bonds – or to banks. For this reason, its managers will have greater freedom of action. They, too, will look favourably on internal financing.

Lastly, as we have seen, the company's creditors will prefer that it rely on internal financing because this will reduce the risk and increase the value of their claims on the company.

This precept is not wrong, but here we must emphasise the dangers of taking it to excess. A policy of *always* or *only* reinvesting internally generated cash flow postpones the financial reckoning that is indispensable to any policy. It is not good for a company to be cut off from the capital markets or for capital mobility to be artificially reduced, allowing investments to be made in unprofitable sectors. The company that follows such a policy in effect creates its own *internal capital market* independent of the outside financial markets. On that artificial market, rates of return may well be lower, and resources may accordingly be misallocated.

The sounder principle of finance is probably the one that calls for distributing all periodic earnings to shareholders and then going back to them to request funding for major projects. In the real world, however, this rule runs up against practical considerations – substantial tax and transaction costs and shareholder control issues – that make it difficult to apply.

> In short, internal financing enjoys an extraordinarily positive image among those who own, manage or lend to the company. However, although internally generated cash flow belongs fundamentally to the shareholders, they have very little control over it. The result is that a policy of reinvesting cash flow can prove to be a time bomb for the company.

2/ INTERNAL FINANCING AND VALUE CREATION

We begin by revisiting a few truisms.

The reader should fully appreciate that, given unchanged market conditions, the value of the company must increase by the amount of profit that it reinvests. This much occurs almost automatically, one might say. The performance of a strategy that seeks to create “shareholder value” is measured by the extent to which it **increases the value of shareholders' equity by more than the amount of reinvested earnings**.

The apparent cost of internal financing is nil. This is certainly true in the short term, but what a trap it is in the long term to think this way! Does the reader know of any good thing that is free, except for things available in unlimited quantity, which is clearly not the case with money? Reinvested cash flow indeed has a cost and, as we have learned from the theory of markets in equilibrium, that cost has a direct impact on the value of the company. It is an **opportunity cost**. Such a cost is, by nature, not directly observable – unlike the cost of debt, which is manifested in an immediate cash outflow. As we explained previously, retaining earnings rather than distributing them as dividends is financially equivalent to paying out all earnings and simultaneously raising new equity capital. **The cost of internal financing is therefore the same as the cost of a capital increase: to wit, the cost of equity.**

Does this mean the company ought to require a rate of return equal to the cost of equity on the investments that it finances internally? No. As we saw in Section 29.3, it is a mistake to link the cost of any source of financing to the required rate of return on the investment that is being financed. Whatever the source or method of financing, the investment must earn at least the cost of capital.[1] By reinvesting earnings rather than borrowing, the company can reduce the proportion of debt in its capital structure and thereby lower its cost of debt. In equilibrium, this cost saving is added on top of the return yielded by the investment to produce the return required by shareholders. Similarly, an investment financed by new debt needs to earn not the cost of debt, but the cost of capital, which is greater than the cost of debt. The excess goes to increase the return to the shareholders, who bear additional risk attributable to the new debt.

Retained earnings add to the company's financial resources, but they increase shareholder wealth only if the rate of return on new investments is greater than the weighted average cost of capital. If the rate of return is lower, each euro invested in the business will increase the value of the company by less than one euro, and shareholders will be worse off than if all the earnings had been distributed to them. This is the market's sanction for poor use of internal financing.

Consider the following company. The market value of its equity is 135, and its shareholders require a rate of return of 7.5%:

Year	Book value of equity	Net profit	Dividend (Div)	Market value of equity (V) P/E = 9	Gain in market value (ΔV)	Rate of return (ΔV + Div)/V
1	300.0	15.0	4.5	135.0		
2	310.5	15.6	4.7	140.4	5.4	7.2%
3	321.4	16.2	4.9	145.8	5.4	7.1%
4	332.7	16.8	6.7	151.2	5.4	8.0%

Annual returns on equity are close to 7.5%. Seemingly, shareholders are getting what they want. But are they?

To measure the harm done by ill-advised reinvestment of earnings, one need only compare the change in the book value of equity over four years (+32.7) with the change in market value (+16.2). For each €1 the shareholders reinvested in the company, they can hope to get back only €0.50. Of what they put in, fully half was lost – a steep cost in terms of foregone earnings.

> Think of reinvesting cash flow (internal financing) as a machine with an energy yield of 1 when the return on reinvested cash flow is equal to the cost of capital. Its energy yield falls below 1 whenever the return on incremental investment is below the required return. When that happens, there is a loss of energy; in other words, value is destroyed, not created.

Beware of “cathedrals built of steel and concrete” – companies that have reinvested to an extent not warranted by their profitability!

Reinvesting earnings automatically causes the book value of equity to grow. It does not cause symmetrical growth in the market value of the company unless the investments it finances are sufficiently profitable – that is, unless those investments earn more than the required rate of return given their risk. If they earn less, shareholders' equity will increase but shareholders' wealth will increase less than the amount of the reinvested funds. Shareholders would be better off if the funds that were reinvested had instead been distributed to them.

In our example, the market value of equity (151) is only about 45% of its book value (333). True, the rate of return on equity (5%) is, in this case, far below the cost of equity (7.5%).

More than a few unlisted mid-sized companies have engaged in excessive reinvestment of earnings in unprofitable endeavours, with no immediate visible consequence on the valuation of the business.

The owner-managers of such companies get a painful wake-up call when they find they can sell the business, which they may have spent their entire working lives building, only for less than the book value of the company's assets. The sanction imposed by the market is severe.

> Only investment at least at the cost of capital can maintain the value of reinvested cash flow. This assumes that investments undertaken (assuming similar level of risk) yield at least the cost of capital of the firm.
>
> When this is not the case, the company is better off giving back the money to shareholders rather than investing it in projects not yielding their cost of capital. Shareholders will then have the opportunity to invest the funds in new sectors that require equity to finance their developments.

In other words, dividends and share buy-backs, which are tools for returning surplus funds to shareholders (and not a remuneration for shareholders as we will see), prevent waste of a scarce resource, equity. By allowing money to circulate, they make the creation and development of new companies to compete with existing ones possible. These are therefore, in the long-run, effective anti-trust and anti-monopoly tools.

3/ INTERNAL FINANCING AND TAXATION

From a tax standpoint, reinvestment of earnings has long been considered a panacea for shareholders. It ought to translate into an increase in the value of their shares and thus into capital gains when they liquidate their holdings. Generally, capital gains are taxed less heavily than dividends.

Other things being equal, then, shareholders will prefer to receive their income in the form of capital gains and will favour reinvestment of earnings. Since the 1990s, however, as shareholders have become more of a force and taxes on dividends have been reduced in most European countries, this form of remuneration has become less attractive.

4/ INTERNAL FINANCING, SHAREHOLDERS AND LENDERS

We have seen (see the discussion of options theory in Chapter 34) that whenever a company becomes riskier, there is a transfer of value from creditors to shareholders. Symmetrically, whenever a company pays down debt and moves into a lower risk class, shareholders lose and creditors gain.

Reinvestment of earnings can be thought of as a capital increase in which all shareholders are forced to participate. This capital increase tends to diminish the risk borne by creditors and thus, in theory, makes them better off by increasing the value of their claims on the company.

The same reasoning applies in reverse to dividend distribution. The more a company pays out in dividends, the greater the transfer of value from creditors to shareholders.

5/ INTERNAL FINANCING, SHAREHOLDERS AND MANAGERS

As we will see in Section 36.3, 2/ under the agency theory approach, internal financing represents a major issue in the relationship between shareholders and managers. Internal financing represents a blank cheque for managers without any control by shareholders. Internal financing is therefore one of the main sources of conflict between managers and shareholders.

Section 36.2 INTERNAL FINANCING AND FINANCIAL CRITERIA

1/ INTERNAL FINANCING AND ORGANIC GROWTH

Growth of the equity of a firm that does not issue shares depends on its return on equity and its payout ratio.

The net profit of a firm with equity of 100 and a return on equity of 15% will be 15. If its payout ratio is 1/3, it will keep 2/3 of its profits, i.e. 10. Equity will then become 110 the next year, a 10% increase, as shown in the table below:

Year	Book value of equity at beginning of year	Net profit (15% of equity)	Retained earnings	Book value of equity at end of year
1	100.0	15.0	10.0	110.0
2	110.0	16.5	11.0	121.0
3	121.0	18.2	12.1	133.1
4	133.1	20.0	13.3	146.4

The book value of a company that raises no new money from its shareholders depends on its rate of return on equity and its dividend payout ratio.

The growth rate of book value is equal to the product of the rate of return on equity and the earnings retention ratio, which is the complement of the payout ratio.

We have:

$$g = \text{ROE} \times (1 - d)$$

where g is the rate of growth of shareholders' equity,[2] ROE (return on equity) is the rate of return on the book value of equity and d is the dividend payout ratio.

This is merely to state the obvious, as the reader should be well aware.

In other words, given the company's rate of return on equity, its reinvestment policy determines the growth rate of the book value of its equity.

2/ MODELS OF INTERNAL GROWTH

If capital structure is held constant, growth in equity allows parallel growth in debt and thus in all long-term funds required for operations. We should make it clear that here we are talking about book values, not market values.

We need only recall that the rate of return on book value of equity is equal to the rate of return on capital employed adjusted for the positive or negative effect of financial leverage (gearing) due to the presence of debt:

$$\text{ROE} = \text{ROCE} + (\text{ROCE} - i) \times D/E$$

or:

$$g = \left[\text{ROCE} + (\text{ROCE} - i) \times \frac{D}{E}\right] \times (1 - d)$$

where g is the growth rate of the company's capital employed at constant capital structure and constant rate of return on capital employed (ROCE).

This is the internal growth model.

It is clear that the rates of growth of revenue, production, EBITDA and so on will be equal to the rate of growth of book equity if the following ratios stay constant:

$$\frac{\text{Revenue}}{\text{Capital employed}}, \quad \frac{\text{Production}}{\text{Capital employed}}, \quad \frac{\text{EBITDA}}{\text{Capital employed}}$$

> Through the internal growth model, we establish a direct link between the rate of growth of the business and the rate of growth of capital employed.

To illustrate this important principle, we consider a company whose assets are financed 50% by equity and 50% by debt, the latter at an after-tax cost of 5%. Its after-tax return on capital employed is 15%, and 80% of earnings are reinvested. Accordingly, we have:

Period	Book equity at beginning of period	Net debt	Capital employed	Operating profit after tax	Interest expenses after tax	Net profit	Dividends	Retained earnings	Book equity at end of period
1	100	100	200	30	5	25	5	20	120
2	120	120	240	36	6	30	6	24	144
3	144	144	288	43.2	7.2	36	7.2	28.8	172.8

This gives us an average annual growth rate of book equity of:

$$g = [15\% + (15\% - 5\%) \times 1] \times 80\% = 20\%$$

The reader can verify that, if the company distributes half its earnings in dividends, the growth rate of the book value of equity falls to:

$$g = [15\% + (15\% - 5\%) \times 1] \times 50\% = 12.5\%$$

The growth rate of capital employed thus depends on the:

rate of **return on capital employed**: the higher it is, the higher the growth rate of financial resources;

cost of debt: the lower it is, the greater the leverage effect, and thus the higher the growth rate of capital employed;

capital structure;

payout ratio.

In a situation of equilibrium, then, shareholders' equity, debt, capital employed, net profit, book value per share, earnings per share and dividend per share all grow at the same pace, as illustrated in the example above. This equilibrium growth rate is commonly called the company's **growth potential**.

3/ ADDITIONAL ANALYSIS

The first of the models above – the internal growth model – assumes all the variables are growing at the same pace and also that returns on funds reinvested by organic growth are equal to returns on the initial assets. These are very strong assumptions.

Suppose a company reinvests two-thirds of its earnings in projects that yield no return at all. We would observe the following situation:

Period	Book equity at beginning of period	Net profit	Return on equity	Dividends	Retained earnings	Book equity at end of period
1	100	15	15.0%	5	10	110 (+10.0%)
2	110	15 (+0%)	13.6%	5 (+0%)	10	120 (+9.1%)
3	120	15 (+0%)	12.5%	5 (+0%)	10	130 (+8.3%)

We see that if net profit and earnings per share do not increase, then growth of shareholders' equity slows and return on equity declines because the incremental return (on the reinvested funds) is zero.

If, on the other hand, the company reinvests two-thirds of its earnings in projects that yield 30%, or double the initial rate of return on equity, all the variables will rise.

Period	Equity at beginning of period	Net profit	Rate of return on equity	Dividends	Retained earnings	Equity at end of period
1	100	15	15.0%	5	10	110 (+10.0%)
2	110	18[3] (+20%)	16.4%	6 (+20%)	12	122 (+10.9%)
3	122	21.6[4] (+20%)	17.7%	7.2 (+20%)	14.4	136.4 (+11.8%)

Although the rate of growth of book equity increases only slightly, the earnings growth rate immediately jumps to 20%.

The rate of growth of net profit (and earnings per share) is linked to the *marginal* rate of return, not the *average*.

> The distribution policy can only be assessed by looking at the marginal return on retained earnings.

Here we see that there are multiplier effects on these parameters, as revealed by the following relation:

$$\frac{\text{Change in net profit}}{\text{Net profit}} = \frac{\text{Change in net profit}}{\text{Change in book equity}} \times \frac{\text{Change in book equity}}{\text{Net profit}}$$

This means that, barring a capital increase, the rate of growth of earnings (or earnings per share) is equal to the marginal rate of return on equity multiplied by the earnings retention ratio (1 − dividend payout ratio).

Section 36.3 WHY RETURN CASH TO SHAREHOLDERS?

When the company is no longer able to find investment projects that return at least their cost of capital, then the question arises as to the use of these funds. Should the company return this excess equity to its shareholders? Even if the theoretical answer is yes, the amount of funds returned to shareholders is not generally equal to the funds that could not be invested at a minimum return equal to the cost of capital. Beyond this simple theory, other factors need to be taken into account.

1/ DIVIDENDS AND EQUILIBRIUM MARKETS

In markets in equilibrium, payment of a dividend has no impact on the shareholder's wealth, and the shareholder is indifferent about receiving a dividend of one euro or a capital gain of one euro.

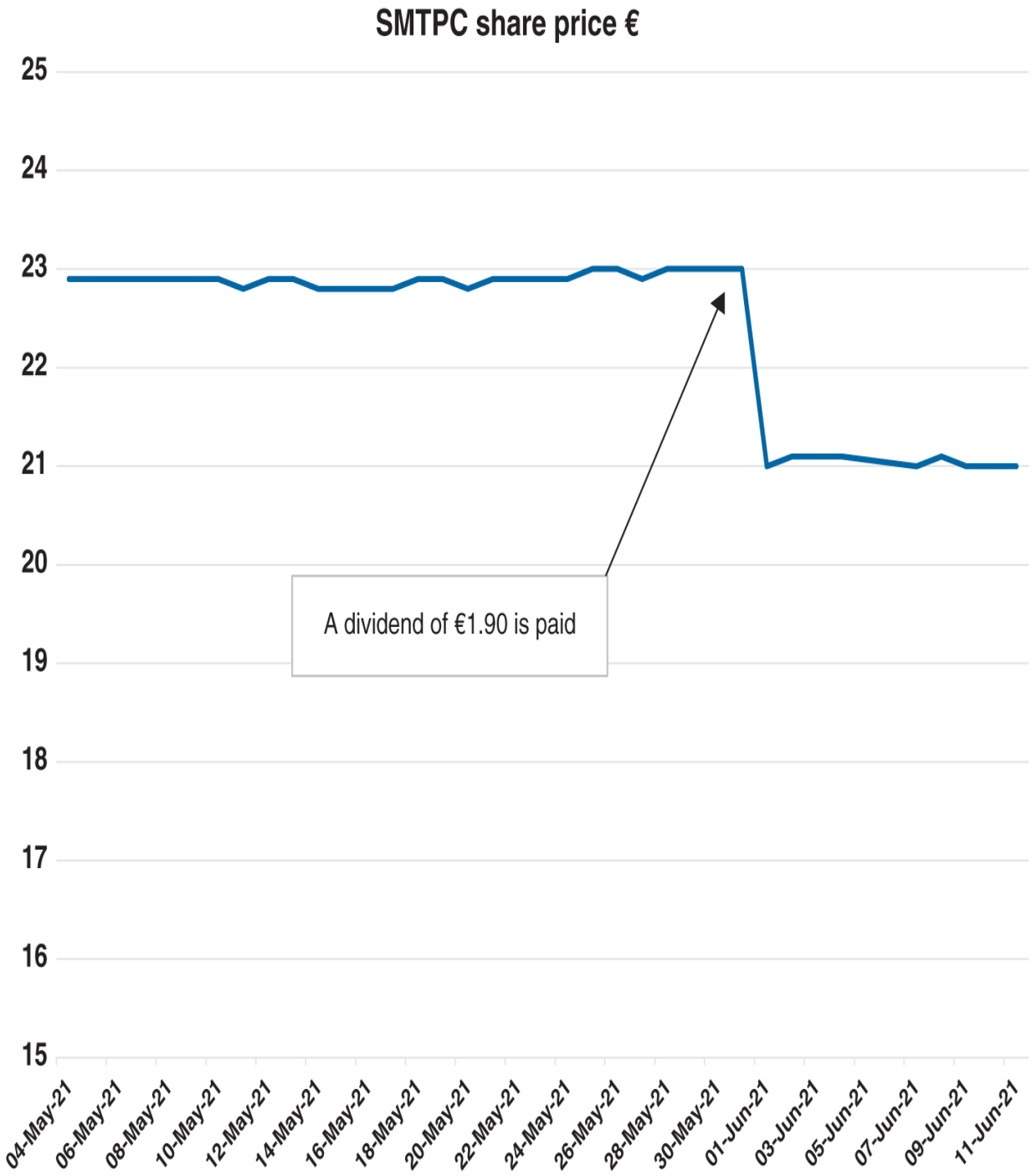
At equilibrium, by definition, the company is earning its cost of equity. Consider a company, Equilibrium plc, with share capital of €100 on which shareholders require a 10% return. Since we are in equilibrium, the company is making a net profit of €10. Either these earnings are paid out to shareholders in the form of dividends, or they are reinvested in the business at Equilibrium plc's 10% rate of return. Since that rate is exactly the rate that shareholders require, €10 of earnings reinvested will increase the value of Equilibrium plc by €10 – neither more nor less. Thus, either the shareholders collectively will have received €10 in cash, or the aggregate value of their shares will have increased by the same amount. **Dividend is not therefore a remuneration** for the shareholder but a mere choice to reinvest or not in the company.

> In markets in equilibrium, there are no good or bad dividend policies.

If the company pays out a high proportion of its earnings, its shares will be worth less but its shareholders will receive more cash. If it distributes less, its shares will be worth more (provided that it reinvests in projects that are sufficiently profitable) and its shareholders will receive less cash – but the shareholder, if they wish, can make up the difference by selling some of their shares.

In a universe of markets in equilibrium, paying out more or less in dividends will have no effect on shareholder wealth. Companies should thus not be concerned about dividend policy and should treat dividends as an adjustment to cash flow. This harks back to the Modigliani–Miller approach to financial policy: there is no way to create lasting value with merely a financing decision.

The chart below plots the share price of SMTPC, which in June 2021 paid an extraordinary dividend of €1.9 in cash. The price of the shares adjusted immediately.



The share price of SMTPC dropped by €1.9, but the net worth of its shareholders does not change as they are now in possession of an additional €1.9 in cash, as well as a share worth €21, for a total value of €22.9, i.e. the value of the SMTPC share prior to the extraordinary dividend payment.

Source: Data from Yahoo Finance

Another demonstration can be found in the fact that a stock market order, if not executed, is automatically adjusted to take into account the payment of a dividend that has taken place

after the order has been submitted.

In any case, it's a fallacy to present dividend distribution as remuneration for shareholders, similar to salaries for the company's employees.

The wealth of the employee increases with the salary. Conversely, the wealth of shareholders is not modified by the dividends they receive: while they are certainly happy about getting this periodical remuneration, they must consider that the value of their shares will fall by an equivalent amount.

If you are in search of an analogy, look no further than the ATM. You do not become richer by withdrawing cash (unfortunately!), because your bank account balance decreases by an equivalent amount, as you have undoubtedly already noticed.

> Dividends do not enrich shareholders. They simply modify their wealth composition, like a transfer from the left to the right pocket.

What about firms that have never paid a dividend, like Google or Berkshire Hathaway (Warren Buffet's firm)? Have they never remunerated their shareholders? Of course they have, and those firms have been very good investments for their shareholders. The return for shareholders comes from the increase in value of their portfolios (including dividends, if any). The dividend is taken into account not because it represents a return for the shareholder, but solely to compensate the drop in value of the share following the dividend payment.

2/ DIVIDENDS AND AGENCY THEORY

Equilibrium market theory has a hard time finding any good reason for dividends to be paid at all. Since in the real world, dividends are paid to investors, new explanations must be sought for the earnings distribution problem.

Creditors and managers are seen as having a common interest in favouring reinvestment of earnings. When profits are not distributed, “the money stays in the business”, whereas shareholders “always want more”.

If the manager directs free cash flow into unprofitable investments, their ego may be gratified by the size of the investment budget, or their position may become more secure if those investments carry low risk.

In addition, retained earnings are one source of financing about which not much disclosure is necessary. The cost of any informational asymmetry having to do with internal financing is therefore very low. It is not surprising that, as predicted by Jensen (1986) and observed in a study conducted by Harford (1999), companies that have cash available make less profitable investments than other companies. Money seems to burn a hole in managers' pockets.

There is a sanction, however, for taking reinvestment to excess (for listed firms with an uncontrolled capital structure) put forward by Jensen (1986): the takeover bid or *tender offer* in cash or shares.

If a management team performs poorly, the market's sanction will, sooner or later, take the form of a decline in the share price. If it lasts, the decline will expose the company to the risk

of a takeover. Assuming the managers themselves do not hold enough of the company's shares to ensure that the tender offer succeeds or fails, a change of management may enable the company to get back on track by once again making investments that earn more than the cost of capital, and thereby lead to a rise in the share price.

The threat of a takeover is not theoretical, it has struck a number of mismanaged groups (Aventis, Reuters, ABN Amro, Club Med, Syngenta, etc.), but the takeover often comes later, after years of underperformance. The dividend policy can help to prevent this situation.

The arrival of activist funds in the shareholding of groups deemed to be poorly managed often takes the form of healthy pressure to increase idle cash returns to shareholders in the form of share buybacks or dividends (Apple, Vivendi).

By requiring managers to pay out a fraction of the company's earnings to shareholders, dividend policy is a means of imposing “discipline” on those managers by forcing them to include in their reckoning the interest of the company's owners. But let us be clear: it is not in the interest of shareholders to receive dividends, but for the company to make investments that at least return their cost of capital. In other words, to prevent a company with too much cash from making bad investments.

A generous dividend policy will increase the company's dependence on either shareholders or lenders to finance the business. In either case, those putting up the money have the power to say no. In the extreme, shareholders could demand that all earnings be paid out in dividends in order to reduce managers' latitude to act in ways that are not in the shareholders' interest. The company would then have to have regular rights issues, to which shareholders would decide whether to subscribe based on the profitability of the projects proposed to them by the managers. This is the virtuous cycle of finance. Although attractive intellectually, this solution runs up against the high costs of carrying out a capital increase – not just the direct costs, but the cost in terms of management time as well.

Bear in mind also that creditors watch out for their interests and tend to oppose overly generous dividends that could increase their risk, as we saw in Chapter 34.

> Even though the dividend is often quite small in relation to the value of equity capital (a few percent at most), it plays an important role. It is a signal from the company to the financial markets. It is an instrument for control of managers by the market, in that it deprives the company of some of the cash the managers would have been able to invest as they saw fit. If the managers still wish to invest that much cash, they will have to borrow; and because debt imposes a discipline of its own (repayment), this pushes them to be more efficient.

3/ DIVIDENDS AS SIGNALS

A justification for the existence of dividends is proposed by the theory of signalling, around which an entire literature has developed, mainly during the 1980s.

> The dividend is a means of communication between the company and the market.

The financial information that investors get from companies may be biased by selective disclosure or even manipulative accounting. Managers are naturally inclined to present the company in the best possible light, even if the image they convey does not represent the exact truth. Companies that really are profitable will therefore seek to distinguish themselves from those that are not through policies that the latter cannot imitate because they lack the resources to do so. Paying dividends is one such policy, because it requires the company to have cash. A company that is struggling is not able to imitate a company that is prospering.

For this reason, dividend policy is a pertinent means of signalling that cannot be faked, and managers use it to convince the market that the picture of the company they present is the true one.

Dividend policy is also a way for the company's managers to show the market that they have a plan for the future and are anticipating certain results. If a company maintains its dividend when its earnings have decreased, that signals to the market that the decline is only temporary and earnings growth will resume. Dividends are paid a few months after the close of the year, therefore the level of the dividend depends on earnings during both the past and the current period. That level thus provides information – a signal – about expected earnings during the current period.

If a firm maintains its dividend while its profits are decreasing, it tells the market that the decrease is temporary and that the increase in profit should resume soon. By contrast, if it drastically reduces or cancels its dividend, it sends a signal on its earnings prospects that will most likely be analysed negatively.

A dividend reduction, though, is not necessarily bad news for future earnings. It might also indicate that the company has a new opportunity and needs to invest. Hence we saw, in the late 1990s, a shift of companies traditionally positioned on mature markets and sectors to geographies and businesses with more growth potential.

Managements will need to avoid the trap of an increase in dividend being interpreted by the market as a decrease in investment opportunities.

> The communication strategy on the dividend policy is key, in particular when there is a change in this policy.

4/ BECAUSE SHAREHOLDERS WISH IT

Baker and Wurgler (2004a, b) have demonstrated that in some periods shareholders demand dividends and are thus ready to pay higher prices for shares with more generous dividends. While our readers know that dividends do not enrich shareholders (since the value of the shares falls correspondingly), shareholders may nonetheless be happy about receiving more dividends. John Rockefeller who in the 1920s said: “Do you know the only thing that gives me pleasure? It's to see my dividends coming in!” was practising behavioural finance ahead of his time!

Conversely, there are some periods when investors prefer companies that retain most of their earnings. In these cases, the stock market penalises generous shares, as happened in the second half of the 1990s: at the end of 1998, Telefónica announced the suppression of its

dividend for financing its expansion in Latin America. At the announcement, the stock increased by 9%.

The reader may wonder why a series of opposite phases are often observed. Waves of optimism lead to the reinvestment of earnings; conversely, pessimism pushes companies to distribute a higher portion of earnings. Finance is a human activity, it is therefore made of trends.

5/ TO PROVIDE SHAREHOLDERS WITH CASH

This is particularly true for private companies, illiquid by nature and for which it is hard to divest shares. It can also apply to small listed companies unable to attract investors' interest, and therefore suffering from low liquidity on the market and low valuations, making them unattractive for selling. Shareholders are human beings after all; they have needs and may need cash for day-to-day life.

6/ TO MODIFY THE FIRM'S SHAREHOLDER BASE

In most cases, giving back cash to shareholders means giving back the same amount on each share. If this is not the case (i.e. through share buy-backs), the shareholder base of the company will be modified. As we will see in the next chapter, the control of the firm can be reinforced by key shareholders not participating in share buy-backs. Shareholders receiving cash will then be diluted.

SUMMARY

The summary of this chapter can be downloaded from www.vernimmen.com.

Net profit can only be used in two ways: it can be reinvested in the firm in the form of retained earnings or distributed in the form of dividends, share buy-backs or a capital reduction.

Internal financing by reinvestment of cash flow enjoys an excellent image: it reduces risk for the creditor and results in capital gains rather than more heavily taxed dividends for the shareholder. For managers, it is a resource they can mobilise without having to go to third parties; as such, it reduces the company's risk and increases the value of their stock options.

For the same reason, though, systematic reinvestment of cash flow can be dangerous. It is not appealing from a financial standpoint if it allows the company to finance investments that bring in less than the rate of return required given their risk. To do so is to destroy value. If the penalty for value destruction is delayed, as it often is because companies that reinvest excessively are cut off from the capital markets, the eventual sanction is all the harsher.

The trap for the unwitting is that internal financing has no explicit cost, whereas its true cost – which is an opportunity cost – is quite real.

Reinvesting cash flow makes organic growth possible at a rate equal to the rate of return on equity multiplied by the earnings retention ratio (1 minus the payout ratio). With constant financial leverage and a constant rate of return on capital employed, the organic growth rate is the same as the growth rate of book equity and capital employed. Lastly, the rate of growth of earnings per share is equal to the marginal rate of return on book equity multiplied by the earnings retention ratio.

Dividends as well as share buy-backs aim at giving back to shareholders funds that cannot be invested by the firm at the appropriate cost of capital. This then allows the firm to avoid value destruction. In macroeconomic terms, it makes it possible to reallocate funds from mature companies to start-ups and developing companies that require equity to finance their business risk.

Dividend payments can serve secondary goals:

reducing the flexibility of the management, who may otherwise invest in value-destroying projects;

signalling that the firm has sufficient stable cash flow to support a high level of debt;

answering the wishes of shareholders, who, depending on the environment, might be willing to pay more for high-payout firms or, on the contrary, low-dividend firms;

granting shareholders cash, as they may need it, in particular when the company is private;

modifying gradually the shareholder base, reinforcing the power of certain shareholders compared to others.

QUESTIONS

1/Why does internal financing enjoy such a positive image?

2/Why is a policy of sticking strictly to internal financing unsound?

3/What determines the rate of growth of capital employed?

4/What should a company do if its rate of return on reinvested earnings is below the weighted average cost of capital?

5/What is the market's sanction for over-reliance on internal financing?

6/In your opinion, which theory best explains the interest of internal financing from an overall standpoint?

7/Show with an example why reinvestment of earnings by the company has no cost for a holder of call options on the company's shares.

8/By what criterion should a policy of reinvesting cash flow be judged?

9/What kind of companies rely heavily on internal financing? What kind do not?

10/Can internal financing lower the cost of capital?

11/What are the advantages and drawbacks of 100% internal financing for family shareholders?

12/Why is internal financing the financial resource with the lowest implementation cost?

13/Under what condition can the dividend growth rate be superior to the growth rate of free cash flow?

14/On the day of the dividend payment, the value of the share drops by the amount of the dividend. Has the shareholder become poorer?

15/Under what condition can you accept that a firm does not pay a dividend?

16/A firm that used to pay no dividends announces its first dividend payment. How would you interpret this according to efficient market theory, signalling theory, agency theory?

17/Do you think tobacco companies have high or low payout ratios? Why?

18/What does this story illustrate? Thanks to the profits made on the distribution of knitting yarns and wools under the Phildar brand, which were very large at the time, the Mulliez family was able to launch the first Auchan supermarkets in the 1960s. Then, with the profits from Auchan, which were very large at the time, it was able to finance investments in renewable energy (Voltalia) from 2005 onwards.

You'll find more questions at www.vernimmen.com.

EXERCISES

1/An entrepreneur is determined to retain control of his company and refuses to accept any outside investors. The company's return on capital employed is 7.5% after tax. He wishes to achieve growth of 20% a year. The cost of debt is 3% before tax, and the tax rate is 25%.

If he has no earnings distribution policy, what capital structure is he choosing implicitly?

If instead he has to pay out one-third of the company's earnings, what capital structure is he choosing?

If he chooses financial leverage (debt/equity) equal to 1, what is the implied normal growth rate of the company?

Which other parameters can he play with?

2/Choose an example of “death spiral” deterioration of capital structure, with an initial positive leverage effect that becomes negative. Construct tables like those presented in this chapter.

ANSWERS

Questions

1/*Because it reduces risk to creditors, results in capital gains rather than more heavily taxed dividends and increases the value of managers' stock options.*

2/*It isolates the company from the capital markets.*

3/*The rate of return on capital employed, the capital structure and the interest rate on debt.*

4/*Pay out all its earnings.*

5/*A takeover bid takes place after years of underperforming investments. Or activists that will pressure management of listed firms.*

6/*Agency theory (interest of a manager to reduce the company risk).*

7/*Holders of call options get no benefit from earnings paid out as dividends, but retained earnings increase the value of the shares and therefore the value of their options.*

8/*The marginal rate of return on investment.*

9/*Mature companies that generate cash. Growth companies with high rates of return.*

10/*No. Unless it changes the risk on capital employed, it has no impact on the cost of capital.*

11/*Capital increases that could dilute the family's shareholding are avoided, but potential dividends are reduced.*

12/*Because nobody else's agreement need be sought before going ahead with it.*

13/*When the company has positive net debt that is being repaid.*

14/*No, as the share price is lower but the shareholder has received in cash (the dividend) the same amount as compensation. Otherwise, there would be arbitrage.*

15/*If its ROCE is above the cost of capital.*

16/*No difference – reduction in agency costs as manager will have less flexibility – growth is slowing down.*

17/*Yes, as growth opportunities are low (but also in order to drug shareholders like they drug their customers!).*

18/*That dividends, by turning over money, allow equity to be reallocated from mature sectors that no longer need it to new sectors where it is needed.*

Exercises

A detailed Excel version of the solutions is available at www.vernimmen.com.

1/

D/E = [(g / (1 − d)) − r_{ce}] / (r_{ce} − i(1 − 25%)) = 2.4. Which is a lot for a poor performing firm!

D/E = 4.3.

g = 12.7% if he pays no dividend, g = 8.5% if he pays out one-third of earnings.

He can try to improve his rate of return on capital employed.

2/*Dubai is a good example of a death spiral with a high leverage effect. This Emirate financed fast growth mainly with debt. When the crisis arrived in 2008, its difficulties accelerated. It had to be saved from bankruptcy by Abu Dhabi.*

Consider the following example of a company for which the leverage effect changes sign in year 4:

	Equity	Debt	Capital employed	Operating earnings after tax	Interest expenses after tax	Net profit	Dividends	Reinvested earnings	Equity at end of period
1	100	100	200	20	8	12	2	10	110
2	110	140	250	25	12	13	1	12	122
3	122	190	312	28	17	11	0	11	133
4	133	258	391	31	26	5	0	5	138
5	138	350	488	34	35	−1	0	−1	137
6	137	474	611	43	47	−4	0	−4	133

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NOTES

1 *For the same level of business risk as for the company's existing operating assets*.

2 *Note that in this section, since no new shares are issued, the growth rate of book value per share is always equal to the growth rate of book value.*

3 *15 + 10 × 30% = 18.*

4 *15 + (10 + 12) × 30% = 21.6.*

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Chapter 37
DISTRIBUTION IN PRACTICE: DIVIDENDS AND SHARE BUY-BACKS

Now, give the money back

The topics addressed in this chapter are the logical complement of the preceding chapter. Distribution of cash can take the form of ordinary dividend payments, but also of exceptional dividends, share buy-backs or capital reductions.

Section 37.1 DIVIDENDS

The dividend is fixed by the board of directors or the ordinary general meeting of shareholders who decide the allocation of earnings based upon the proposal from the board of directors (or the supervisory board). It is then paid to shareholders in the following days or weeks.

1/ PAYOUT RATIO AND DIVIDEND GROWTH RATE

In practice, when dividends are paid, the two key criteria are:

the rate of growth of dividends per share;

the **payout ratio** (*d*), represented by

$$d = \frac{\text{Dividend}}{\text{Net profit}}$$

All other criteria are irrelevant, frequently inaccurate and possibly misleading. For example, it is absurd to take the ratio of the dividend to the par value of the share, since par value has little to do with equity value.

> Hence the difficulty for a company of meeting a dividend yield objective. It is the shareholder who, when evaluating the company, determines the desired yield, not the other way around.

As established by John Lintner, management therefore has an objective expressed in terms of the payout rate applied to the level of future profits. Their objective is to distribute a fixed percentage of the company's profits. This is the case of Schneider, which pays out around 50% of its profits in dividends excluding exceptional items, as it announced in 2015.

In Europe, a payout ratio lower than 20% is considered to be a low dividend policy, whereas one greater than 70% is deemed high. The average in 2020 was about 50%. A important proportion of large groups have reduced or eliminated their dividends in 2020, which explains why so many 2020 payouts are zero, or abnormally high because some groups, while their profits temporarily fell, maintained their dividends.

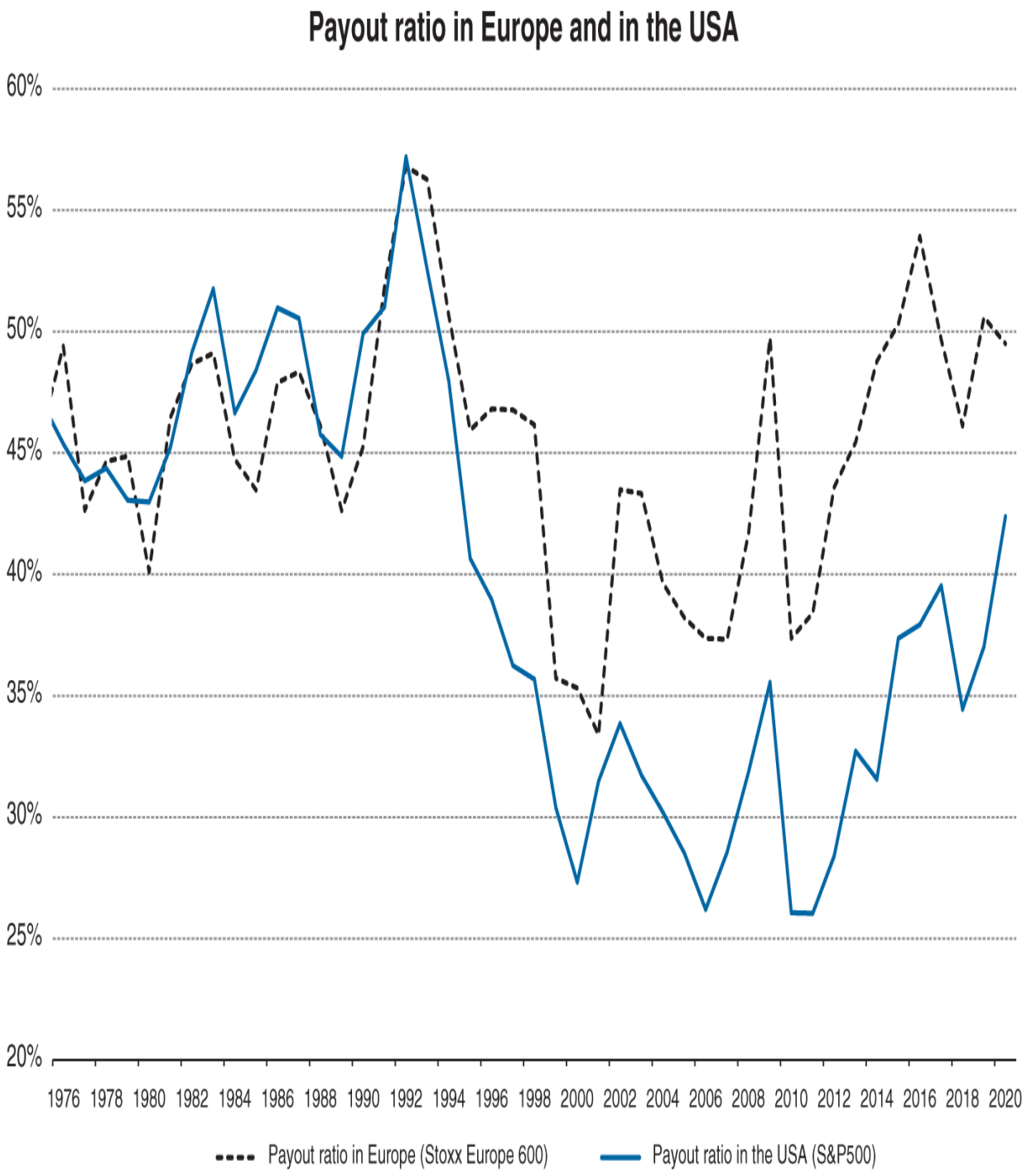
Payout ratio for large European listed groups in 2020									
d ≈ 0%		**0%<d<30%**		**30%<d<50%**		**50%<d<70%**		**70%<d**	
Critéo	0%	Casino	0%	Fresenius	29%	Orange	52%	LafargeHolcim	73%
Unibail-Rodamco	0%	Alstom	0%	Colruyt	30%	Covestro	52%	BHP Billiton	75%
Continental	0%	Air France KLM	0%	Puma	30%	Air Liquide	53%	Thales	78%
Worldline	0%	Barclays plc	11%	Dassault Av.	34%	Richemont	55%	Eiffage	78%

Payout ratio for large European listed groups in 2020									
d ≈ 0%		**0%<d<30%**		**30%<d<50%**		**50%<d<70%**		**70%<d**	
Vallourec	0%	Serco Group	13%	Capgemini	34%	Metro	55%	Publicis	83%
Thyssenkrupp	0%	Cie Automotive	17%	Hermès	35%	Henkel	57%	Energias de Portugal	87%
Tarkett	0%	Atos	18%	Moncler	38%	Arkema	58%	Tesco	92%
Telecom Italia	0%	Biomérieux	18%	Burberry	38%	L'Oréal	63%	Vinci	92%
Sodexo	0%	Bonduelle	23%	Almirall	38%	LVMH	64%	Nexity	95%
Renault	0%	Apple	24%	SEB	39%	Danone	64%	Axa	114%
Nokia	0%	Ferrari	26%	SAP	44%	Michelin	65%	Saint-Gobain	156%
Airbus Group	0%	Erste Bank	27%	Kering	46%	Schneider	68%	TF1	171%
Compass	0%	Carrefour	28%	Vivendi	48%	Deutsche Telekom	68%	Pernod Ricard	213%

Source: Data from Factset.

In 2020, 122 out of the 600 largest listed companies in Europe paid no dividend (vs. 35 the year before!). The Covid-19 pandemic has for sure had an impact on dividends.

The payout ratio can, from time to time, vary to allow a smooth evolution of dividends compared to more volatile changes in earnings.



Source: Factset - Datastream - Exane BNP

In 1991–1993, 2009, and 2014–2016, payout ratios in Europe and the US were quite high (over 50%), but the explanation has more to do with poor earnings than with any change in dividend policy. To avoid a cut in dividend per share, managers allowed the payout ratio to rise temporarily. Conversely, in 1986–1989, 2000–2001, and 2005–2007, years of very good profits, payout ratios were low. The American payout ratios appear to be lower because of the share buy-backs not taken into account in the payout ratio computation, which are far more

frequent in the US, and because of the larger number of fast-growing (and/or loss making) listed companies distributing few dividends or none at all.

Some degree of regularity is desirable, either in earnings growth or in dividends paid out, so the company must necessarily choose an objective for the profile of dividends over time. Dividend profiles typically fit one of the following three descriptions:

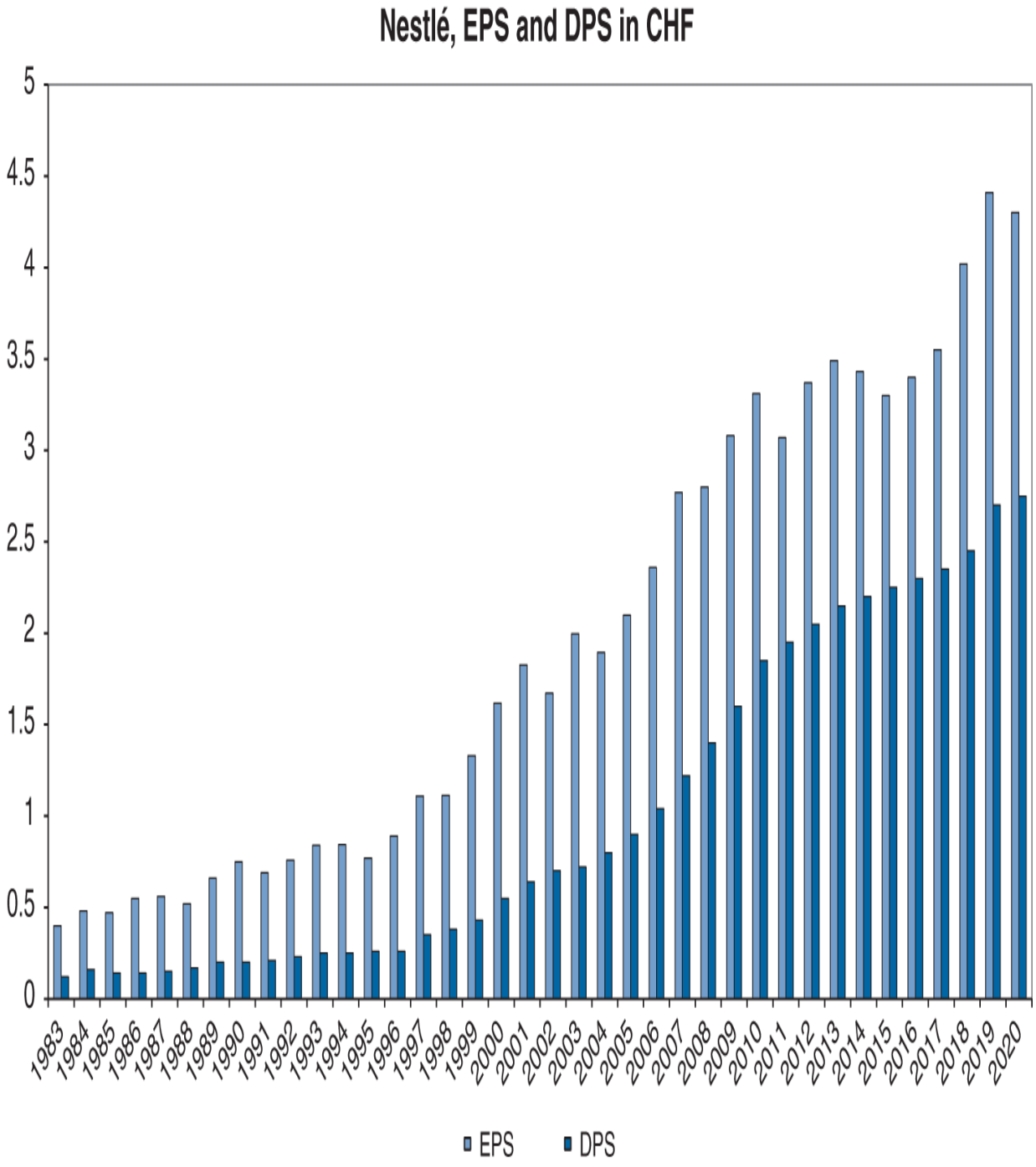
If earnings growth is regular, dividend policy is of lesser importance and the company can cut its payout ratio at no risk (while increasing the absolute value of the dividend).

If earnings are cyclical owing to the nature of the business sector, it is important for the dividend to be kept steady. The company needs to retain enough room to manoeuvre to ensure that phases of steady dividends are followed by phases of rising dividends.

Lastly, an erratic dividend conveys no useful information to the investor and may even suggest that the company's management has no coherent strategy for doing business in its sector. A profile of this kind can hardly have any beneficial effect on the share price.

> A dividend policy must be credible – that is, consistent with the earnings that the company achieves. In the long term, no dividend profile, regardless of how smooth it is, can have favourable effects unless it appears sustainable. In other words, it must not be inconsistent or incompatible with the earnings profile.

Compare, for example, the dividend and earnings profiles of two industrial groups since 1983: Nestlé (a growth company) and Ford (a cyclical one):


Nestlé, EPS and DPS in CHF
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
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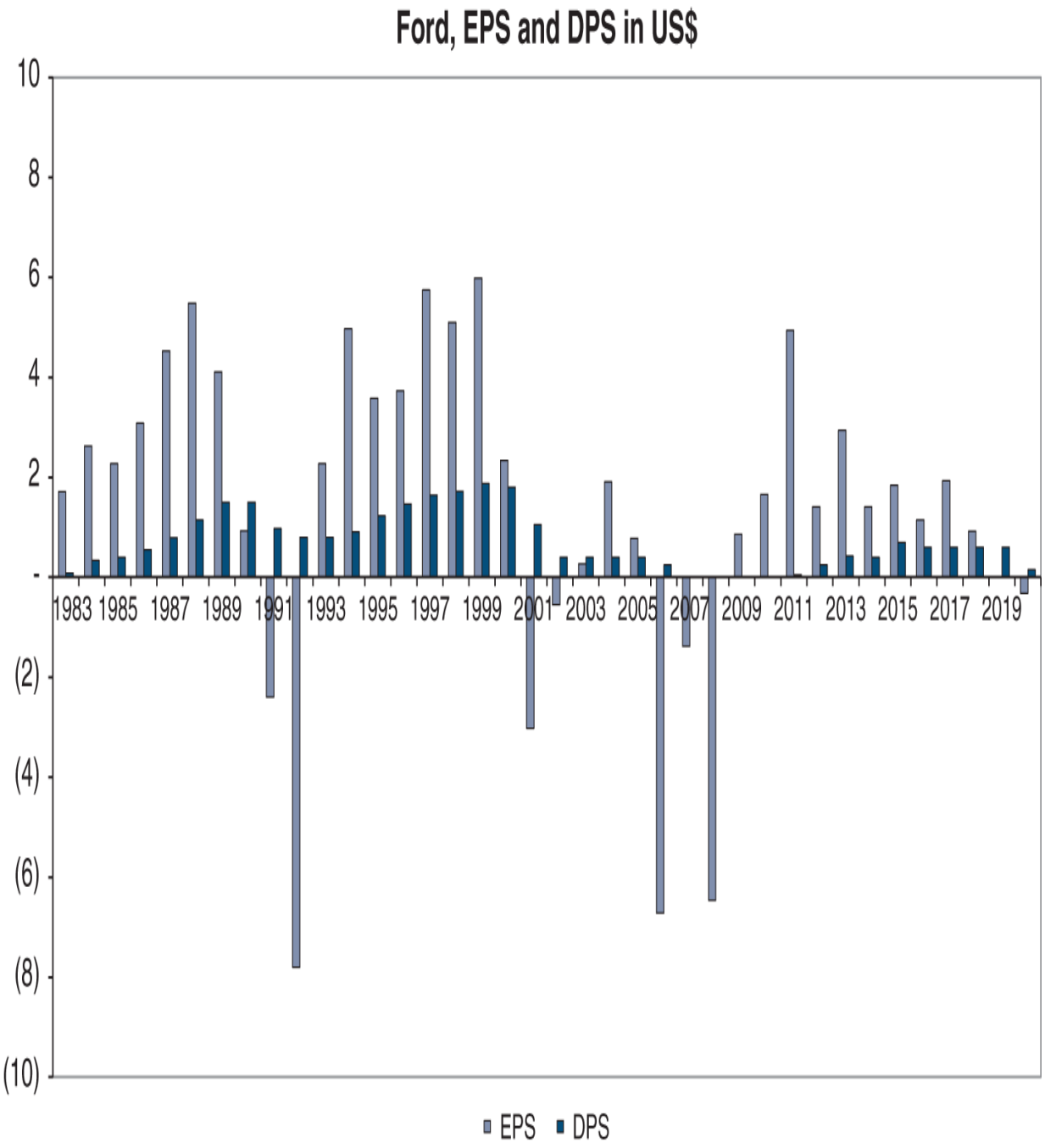
DPS



On the stock market, a high payout ratio implies low price volatility, other things being equal. The share price of a company that pays out all its earnings in dividends will behave much like the price of a bond.

Here we re-encounter the concept of *duration*. The security with the highest duration will also have the highest volatility. A high payout ratio tends to reduce duration and thereby makes the share price less volatile.

Of course, the payout ratio is not the only determinant of a share's volatility. For a company, paying out little or none of its earnings translates into growth in book value, an increase in market value and thus eventually into capital gains. To realise those gains, though, the shareholder has to sell. If selling the company's shares is a “crime” – and some managers come close to regarding it as one – then a low-dividend policy is an inducement to crime. A family-owned company that pays low dividends risks weakening the family control.

A high-dividend policy, on the other hand, is certainly one way of retaining the loyalty of shareholders that have got used to the income and have forgotten about the value. This tends to be particularly true of shareholders without management roles in unlisted family companies.

2/ HOW DIVIDENDS ARE PAID

(a) Interim dividend

This practice consists in paying a fraction of the forthcoming dividend in advance. The decision is taken by the board of directors (or the executive board) and need not be approved by the AGM (the AGM retrospectively ratifies this choice). A dividend offers a way of smoothing cash inflows to shareholders and cash outflows from the company. The interim dividend is typically paid in December or January (midway between two annual dividend dates) and represents between a quarter and a half of the annual dividend. In the US, Canada and the UK, quarterly or semi-annual dividends are common.

(b) Dividend paid in shares (scrip dividend)

Companies may offer shareholders a choice of receiving dividends in cash or in shares of the company, if such a possibility is provided for in the company's by-laws.[1] The decision is taken by shareholders at the ordinary general meeting at which the accounts of the year are approved.

Paying the dividend in shares allows the company to make a distribution of earnings while retaining the corresponding cash funds.

Offering to pay dividends in shares may lead to some limited redistribution of ownership among the shareholders, since some will accept and others will decline.

A share dividend represents no special financial advantage for shareholders other than the ability to reinvest dividends at no charge and generally at a slight discount to the market price (at most 10%). Some investors have no compunctions about taking payment of their dividends in shares and immediately selling those shares in order to pocket the discount. Manipulation of this kind drives down the price. This explains why this technique, which was very popular at the beginning of the 1990s, had practically disappeared before finding a new lease on life since 2008 when groups (Total, Carrefour, etc.) used it to strengthen their equity while trying to avoid the negative signal of a suppressed dividend during bad economic times for them. Even with a 10% discount, the firm cannot be sure of whether its shareholders will choose cash or shares, since there is a delay between the EGM that fixes the price and the actual choice of the shareholders and issue of the shares. The changes in share price during this period can erase the discount and make a cash dividend more attractive.

In a 2015 study, Edith Ginglinger and Thomas David found in a large sample that the payment of a scrip dividend was not interpreted negatively by shareholders (in contrast to the reduction of the dividend). It is also interesting to note that investors are not perfectly rational in their choice. For example, when the discount to the share price is still present at the time of payment, the option rate for the scrip dividend is far from 100%. And when the discount no longer exists or is even negative, about one third of shareholders still accept the payment of the dividend in shares.

(c) Preferential dividend

To reward loyal shareholders that have held their shares for over a certain period (e.g. more than two years), some companies (for example, Air Liquide) have instituted the practice of paying a preferential dividend. A preferential dividend can be established only by decision of an extraordinary general meeting when authorised by local laws.

Lastly, we should mention once again preference shares, which have a higher dividend than ordinary shares.

Section 37.2 EXCEPTIONAL DIVIDENDS, SHARE BUY-BACKS AND CAPITAL REDUCTION

A company may, in certain circumstances, buy back its own shares and either keep them on the balance sheet or cancel them, in which case there is said to be a **capital decrease** or **capital reduction**. Even when shares are repurchased but not cancelled, analysts will (in their own calculations) reduce the number of shares in circulation by the quantity of shares bought back.

Neglecting taxes, if one supposes that the company buys back shares from all shareholders in proportion to their holdings and then cancels those shares, the resulting share buy-back is strictly identical to the payment of a dividend. Cash is transferred from the company to the shareholders with no change in the structure of ownership. As we shall see below, however, an actual capital reduction most often does not even involve all shareholders.

1/ SPECIAL DIVIDEND

The special dividend (or exceptional dividend) is a dividend of an exceptionally high amount compared to the ordinary dividend. It is obviously not paid on a regular basis and usually corresponds to an exceptional event within the business life of the company (disposal of a large subsidiary, end of a lawsuit, etc.). For example, Orange paid an exceptional dividend of €0.2 in 2021 as a result of a tax refund from the State.

The special dividend is sometimes the tool used by a group to dispose of an asset (22% of Hermès by LVMH) or a branch (Faurecia by Stellantis).

2/ SHARE BUY-BACKS

Only listed firms can buy their own shares back on the market. Depending on the country, the buy-backs have to be authorised by shareholders and may be limited in volume (for example, a maximum of 10% of the shares every year or 18 months) and in price (a maximum share buy-back price is set). Generally, the shares bought back will be cancelled but they can also be kept by the company (as treasury stocks) to be handed over in the case of an acquisition, for the exercise of stock options or for the conversion of convertible bonds. Treasury shares lose their voting right and their right to a dividend. They can also be used to enhance liquidity through a liquidity programme implemented by a broker.

The implementation of share buy-backs of listed companies is often outsourced to banks for a predefined period of time and with predefined amounts to be repurchased, thus avoiding constraints linked out blackout periods before earnings announcement and the risk of insider trading for the company!

In this context, an ESG dimension can be included in the buy-back programme. The bank, which buys the shares on behalf of the company, contributes to an NGO the difference between the market price over the execution period and the actual purchase price of the shares, i.e. the gain made from a (marginally) lower price than the average market price. In March 2021, BIC launched ESG impact share buy-back.

Furthermore, share buy-backs can be used to ease the exit of a large minority shareholder. In this way, Regeneron eased the exit of Sanofi from its capital in buying back some $5bn of shares in 2020 (the rest of the participation has been sold on the market).

Under US GAAP and IFRS, treasury stocks are deducted from the amount of shareholders' equity.

3/ CAPITAL REDUCTION

A capital reduction corresponding to a distribution of cash can be accomplished:

By reducing the par value of all shares, thereby automatically reducing authorised capital.

By **tender offer**. In practice, the board of directors, using an authorisation that must have been granted to it at an extraordinary general meeting, makes an offer to all shareholders to buy all or part of their shares at a certain price during a certain period (usually about one month). If too many shares are tendered under the offer, the company scales back all the surrender requests in proportion. If too few are tendered, it cancels the shares that are tendered. If management decides on a tender offer, it has the option of considering the traditional fixed-price offering or the *Dutch auction method*. In Dutch auctions, the firm no longer offers to repurchase shares at a single price, but rather announces a *range* of prices. Each shareholder thus must specify an acceptable selling price within the prescribed range set by the company. If they choose a high selling price, their proceeds will increase, provided that the shares are accepted by the company, but the probability that shares will be accepted for repurchase will be reduced. At the end of the offer period, the firm tabulates the received offers, and determines the lowest price that allows repurchasing the desired number of shares.

In some countries, a share buy-back can be accomplished by issuing **put warrants** to each shareholder, each warrant giving the holder the right to sell one share to the company at a specified price. Such a warrant is a put option issued by the company.

A capital decrease changes the capital structure and thereby increases the risk borne by creditors. To protect the latter, the law generally allows creditors to require additional guarantees or call their loans early, although they cannot block the operation outright.

4/ THE IMPACT ON THE COMPANY AND ITS RATIOS

Consider a company with book value of equity of €400m, one million shares outstanding and earnings of €20m. Suppose that it reduces its share capital by 20% by buying back its own shares at their market value, in one case at €200 per share and in another case at €800 per share. It pays for the buy-back by borrowing at 3% after tax (or by liquidating short-term investments earning 3%, which amounts to the same thing).

BEFORE					
Price per share	**Book value of equity**	**Market value of equity**	**Earnings**	**EPS**	**P/E**
€200	€400m	€200m	€20m	€20	10
€800	€400m	€800m	€20m	€20	40

AFTER

Price per share	Book value of equity	Market value of equity	Earnings	EPS	P/E
Price per share	Book value of equity	Market value of equity	Earnings	EPS	P/E
€200	€360m	€160m	€18.8m	€23.5 + 17.5%	8.5
€800	€240m	€640m	€15.2m	€19 − 5%	42.1

After the transaction, the book value of equity has decreased by the amount of funds spent on the repurchase – €40m in one case, €160m in the other – and so has the market value. Going forward, earnings are reduced by the additional interest charges. The relevant analysis, however, is at the per-share level. The repurchase is made at the current share price (or at current value, if the company is not quoted), possibly increased by a premium of 5% or 10% to induce holders to tender their shares under the offer.

In our example, with a repurchase at €200, earnings per share increase by 17.5% and decrease by 5% with repurchase at €800.

> More generally, repurchase of shares by the company results in an increase in earnings per share (accretion) whenever the reverse of P/E is greater than the after-tax rate of interest paid on incremental debt (or earned on short-term debt securities). If E/P is less than the rate of interest, there is a decrease in earnings per share (dilution).

The transaction is thus the inverse of a share issue, which should come as no surprise to the reader. Bear in mind that, although the calculation of the change in earnings per share is of interest, it is not an indicator of value creation. The real issue is not whether a capital decrease will mechanically dilute earnings per share, but whether:

the price at which the shares are repurchased is less than their estimated value;

the increase in the debt burden will translate into better performance by management; and

the marginal rate of return on the funds returned to shareholders by the buy-back was less than the cost of capital.

These are the three sources of value creation in a capital decrease.

We frequently see it argued that a capital decrease, by replacing a more costly form of financing (equity) with a less costly one (debt), lowers the weighted average cost of capital. The reader who has absorbed the lessons of Modigliani and Miller and understands that cost of capital is independent of capital structure (remember “the size of a pizza is the same no matter how you slice it”?) may be indulgent. To err is human; only to persist in error is diabolical!

A capital decrease, by itself, does not reduce a company's cost of capital and thus cannot create value. At best, it can avoid value destruction by preventing the company from investing cash at less than the cost of equity.

Only if the company manages to buy back its shares at less than they are worth could it hope to create value. The theory of markets in equilibrium leaves little hope of being able to do this.

Share buy-backs are becoming a normal way of reallocating cash from mature businesses to newer sectors or faster-growing companies.

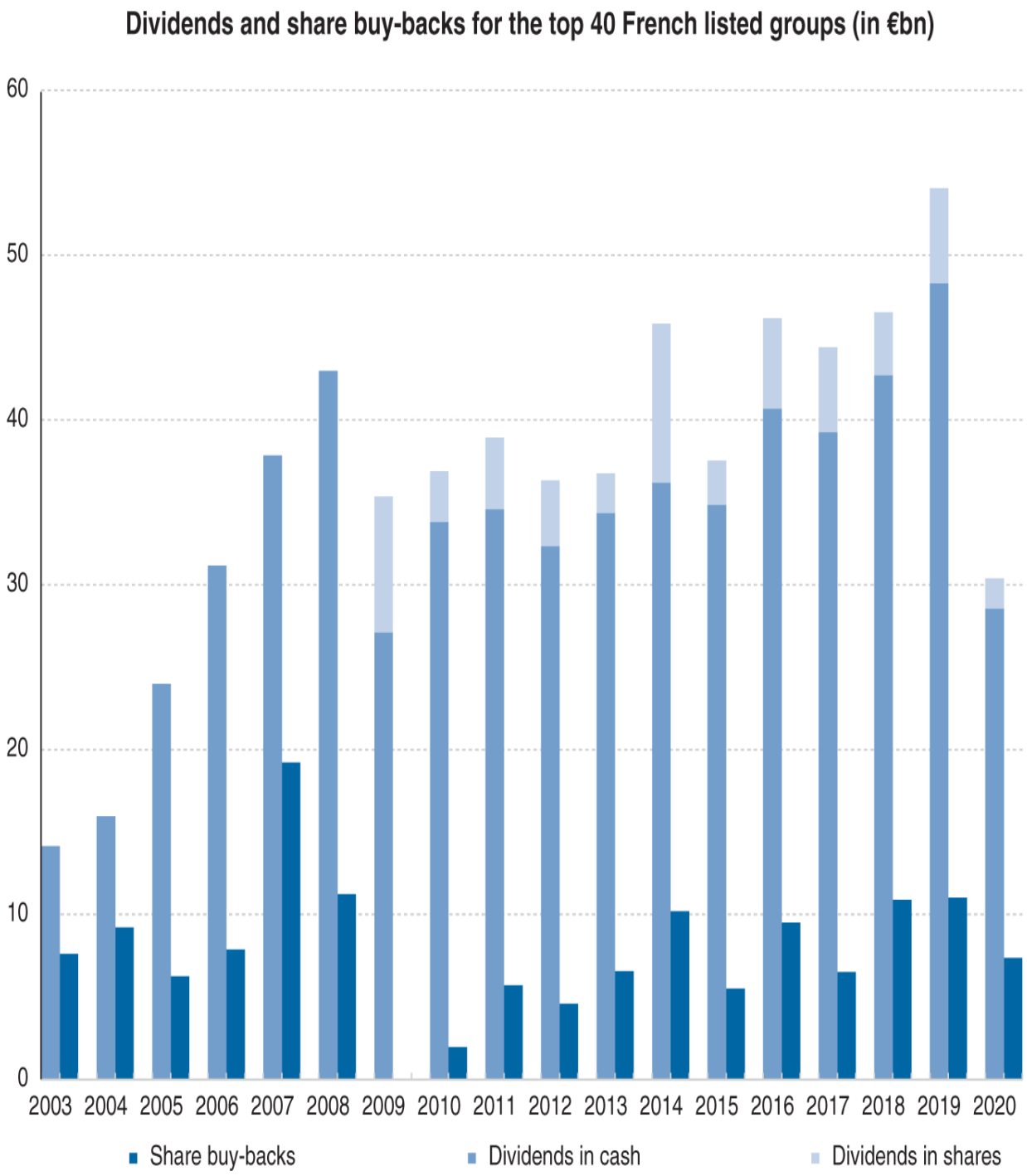
As an illustration, here are the top 20 share buy-backs in 2020 in Europe:

Top 20 Share Buy-backs in Europe in 2020					
	Company	**€m**		**Company**	**€m**
1	Nestlé	6 368	11	Siemens	1 517
2	Iberdrola	2 710	12	SAP	1 492
3	ABB	2 491	13	Aon	1 441
4	Accenture	2 383	14	Diageo	1 432
5	E.ON	2 377	15	Iliad	1 400
6	Novartis	2 323	16	Royal Dutch Shell	1 391
7	Novo Nordisk	2 264	17	UBS	1 296
8	Vivendi	2 148	18	ASML	1 208
9	Linde	2 008	19	ACS	1 193
10	Johnson Controls	1 801	20	Barclays	1 180

Source: Data from FactSet, Companies information

Section 37.3 THE CHOICE BETWEEN DIVIDENDS, SHARE BUY-BACKS AND CAPITAL REDUCTION

Dividends, share buy-backs and capital reductions are all ways to return cash to shareholders, but as they have different impacts on a company's parameters, one cannot be used instead of another. For instance, in Europe, share buy-backs amounted to almost nothing in the mid-1990s, while they reached about €230bn in 2007 and then dropped sharply in 2008 and 2009 before coming back to average levels in 2011–2016. We illustrate that with the example of the French market:



Source: La Lettre Vernimmen.net janvier 2021, n°185.

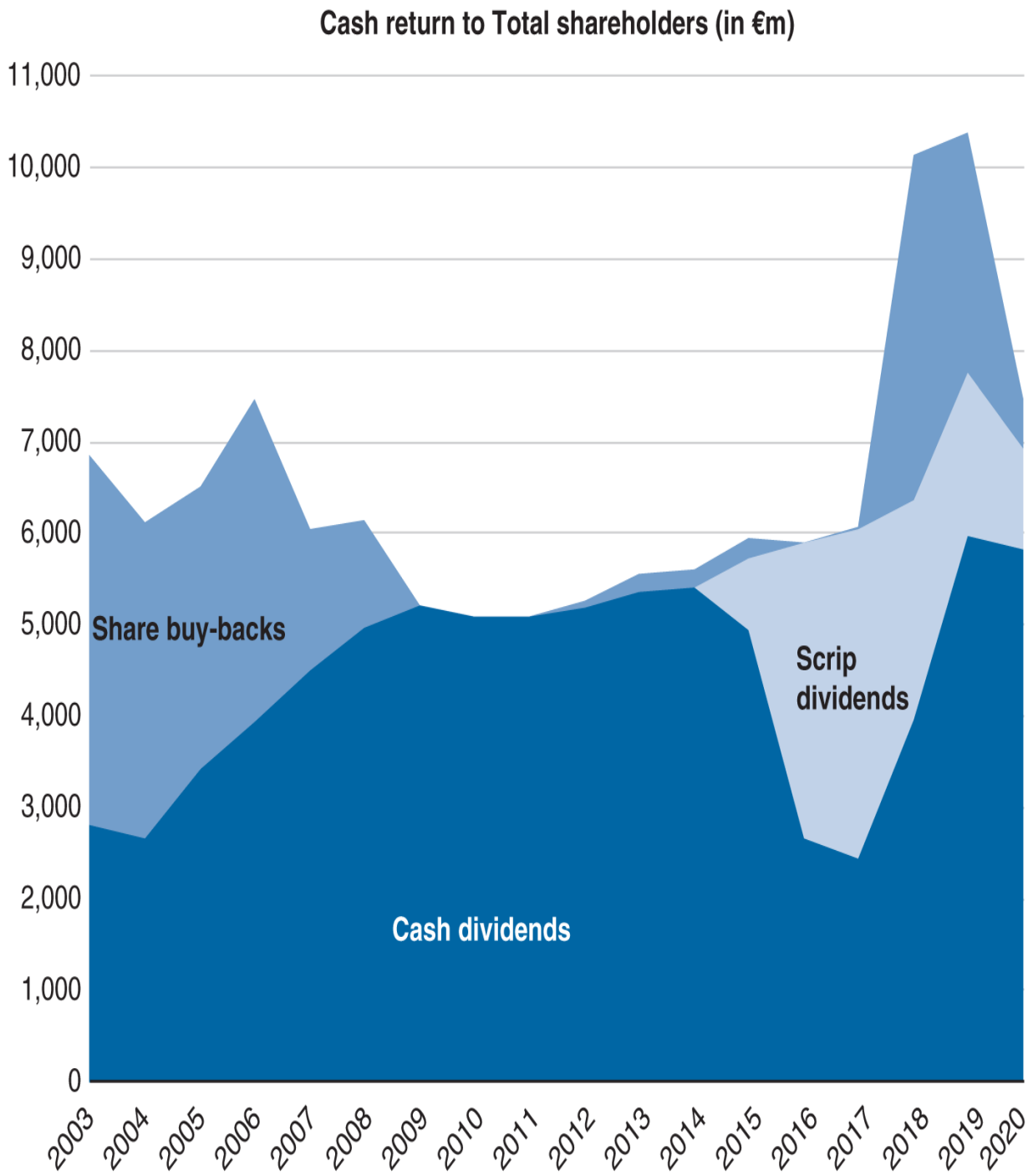
Five criteria can be used to understand the choice of the best technique for distributing the excess cash, given the desired objective.

1/ FLEXIBILITY

Once a dividend has been increased, it is tricky, especially for listed companies, to reduce it unless there is a significant deterioration in earnings. Any change in the dividend policy raises

concerns about the future evolution of the business model and any increase creates expectations regarding the medium-term sustainability of the new level of dividends. This is the major reason for which changes in the dividend policy generally occur very slowly and produce effects on the capital structure only after some periods.

Conversely, share buy-backs, capital reductions and extraordinary dividends are specific *una tantum* decisions, and investors do not expect any regularity regarding them. They can perfectly fit situations where the company wants to distribute the cash generated by an important asset (disposal by Sword of its French subsidiaries in 2021), an asset itself to refocus the group (UMG by Vivendi in 2021) or intends to modify the capital structure rapidly.



Source: Data from Annual reports

TotalEnergies operates in a cyclical sector and does not want to have to reduce its dividend per share. Therefore, in the early 2000s, when its results start to rise sharply, it increased its dividend less rapidly and bought back the balance of its shares. These were then gradually reduced as the dividend increased and disappeared altogether when the results become less good from 2008. Then, when the latter fell sharply between 2014 and 2017, Total maintained its dividend per share, despite insufficient free cash flow, but paid it in part in shares so as not

to increase its debt. With the recovery in oil prices in 2018, Total resumed share buy-backs to neutralise the shares created by the payment of the dividend in shares in previous years. While it had planned to stop stock dividends altogether, the Covid-19 pandemic forced it to resort to them again.

Share buy-back programmes are as flexible and are appropriate for returning temporary excess cash flows to shareholders pending an increase in payout, a drop in earnings, or an increase of the company's investment needs. This is how groups stopped them in 2008–2009 before gradually resuming them from 2010, or how Sanofi stopped them in 2019, after its 2018 acquisitions (totalling €13.4bn), before resuming them in 2020.

2/ SIGNALLING

All financial decisions send signals to investors, and thus the company must ponder the expected perception investors may have following the adoption of a specific financial tool for redistributing liquidity.

Applying this principle to dividends, we can reasonably say that the most neutral solution is represented by the extraordinary dividend: it is non-recurring and it does not imply any judgement on the value of the stock. Moreover, it benefits all investors.

Changes in ordinary dividends and capital reductions, however, are clearly perceived as signals sent to the market: in the former case, regarding the level of future earnings; in the latter case, regarding the stock price because a company would not buy a portion of its shares if the management believed that the shares were overvalued.

Jagannathan *et al*. (2000) have demonstrated that share buy-backs give little information about future results compared to dividends. While companies that increase dividends show an improvement of results, a similar conclusion cannot be reached with share buy-backs. The distribution of dividends contains a commitment from the management to maintaining the same level of dividend (or increasing them) for a certain number of periods; share buy-backs do not imply an analogous commitment. Thus, cyclical companies are more inclined to use share buy-backs than non-cyclical companies.

3/ IMPACT ON SHAREHOLDER STRUCTURE

Ordinary and extraordinary dividends do not affect the shareholding structure because they do not modify the number of outstanding shares. On the contrary, capital reductions and share buy-backs affect shareholder composition because some shareholders may simply decide not to participate in the capital reduction or to sell their shares in the case of a share buy-back. Their percentage of control increases.

As an example, the share buy-backs of Dassault Aviation on 14% of its capital allowed the Dassault family to increase its stake from 50% to 59% in 2015. An increase in dividend would probably have been complex in such a cyclical sector as military and business aircrafts; a special dividend would not have allowed for an impact on shareholding.

4/ IMPACT ON STOCK OPTIONS

According to the current legislation of some countries, the capital reduction realised by buying back shares at a high price requires an adjustment of the exercise price of the stock options with a neutral effect on stock option holders.

However, some legal systems do not regulate similar adjustments in the case of ordinary or extraordinary dividends. Since an extraordinary dividend can strongly reduce the stock price, the absence of any adjustment of the exercise price of the stock options explains why this instrument is not favoured by the management.

The strong decrease in the number of companies distributing a dividend (66% in 1978 vs. 21% in 1999[2]) in America until early this century can also be at least partially explained by the increasing popularity of share buy-backs, probably pushed up by the managers holding stock options.[3]

In fact, the distribution of a dividend mechanically reduces the stock price, thus decreasing the probability of a high capital gain for stock option holders. The share buy-back does not generate this negative effect on the value of the stock options. It also leaves unsophisticated investors believing that the stock price will go up.

5/ TAX ISSUES

Tax is naturally an important element that requires close attention. For individual investors belonging to the top classes of personal income, generally speaking taxation is lower on capital gains than ordinary dividends. This pushes shareholders to consider share repurchases more favourably.

SUMMARY

The summary of this chapter can be downloaded from www.vernimmen.com.

A dividend policy is assessed on the basis of the payout ratio and the growth rate of the dividend per share. The dividend does not constitute a remuneration of the shareholder since its collection is accompanied by a decrease in the share value by the same amount.

An exceptional dividend by its amount may be paid in addition to the ordinary dividend.

A company may buy back small quantities of shares that it will cancel or keep or larger quantities of shares through a public share buy-back tender offer in which the shareholders are free to participate or not.

The capital reduction or share buy-back leads to growth in earnings per share if the reverse of the P/E ratio of the share is higher than the after-tax interest rate of the debt incurred (or short-term investments used to finance it). But make no mistake, this has nothing to do with value creation.

Value is only created if the increased debt burden forces managers to perform better, or if shares are bought back at a price below their value, or if the funds thus returned to shareholders are invested in the company at an insufficient return.

The big difference between, on the one hand, the dividend and, on the other hand, the exceptional dividend, the share buy-back and the capital reduction, is that the dividend is normally recurrent and any change in its level is perceived as a signal. On the other hand, exceptional dividends, share buy-backs and capital reductions are one-off operations, not recurring in nature.

The choice of tools used to return cash to the shareholder also depends on the impact on the composition of the shareholder base and on management stock options and, finally, on tax considerations.

QUESTIONS

1/What are the two criteria by which a dividend policy should be judged?

2/Does an increase in the dividend result in an increase in the value of the share?

3/Given tax neutrality, would you prefer to receive dividends or realise capital gains?

4/Does a manager who holds stock options in the company prefer buy-backs or dividends? Why?

5/Is there a cost to the company of issuing bonus shares? Does such an issue change shareholder wealth? What purpose does it serve?

6/Does a high dividend provide assurance of a stable share price? Why?

7/Can a company have a target dividend yield for its shareholders? Why or why not?

8/What is the natural temptation of a company that is required by its shareholders to pay out 100% of its earnings, in terms of how much earnings it records?

9/Is a manager who holds stock options in favour of a high-dividend policy? Why or why not?

10/What signal is sent by paying a dividend in shares?

11/Explain why a sharp increase in dividend often results in a decrease in the value of the company's borrowings.

12/What is the impact of a debt-heavy capital structure on the payout ratio?

13/In what circumstances does a company have a good reason to undertake a capital decrease?

14/Forgetting tax considerations, can a capital decrease enhance the value of the company's operating assets? The value of its shares?

15/What difference do you see between payment of dividends and capital reduction?

16/What is the necessary condition for a share buy-back to increase earnings per share? To increase the book value of equity capital per share?

17/What does a share buy-back programme mean for the company's creditors?

18/Under what conditions might a fast-growing company with opportunities to invest at a rate of return higher than its cost of capital undertake a capital decrease?

You'll find more questions at www.vernimmen.com.

EXERCISES

1/On 21 May 2021, you observe the following data on Yahoo! Finance:

Publicis share price: €55

Net dividend per share: €2.15

Earnings per share: €4.46

Calculate Publicis's payout ratio and the dividend yield. What do you think?

2/What do you think of the dividend policies of the following companies?

		2014	2015	2016	2017	2018	2019	2020
(A)	EPS	100	115	131	150	160	165	167
	DPS	20	23	26	30	35	41	60
(B)	EPS	350	402	458	524	559	577	584
	DPS	70	80	92	105	112	115	117
(C)	EPS	100	50	0	−50	−50	0	50
	DPS	5	5	5	5	5	5	6
(D)	EPS	500	520	550	600	500	400	300
	DPS	100	80	70	100	120	150	200

3/Gassoumi plc has the following characteristics:

Net earnings: £100m

Number of shares: 1,000,000

Market price per share: £1,000

Book value of equity: £1,200m

EPS: £100

Book value per share: £1,200

The company decides to take advantage of a sudden stock market slump by buying back a quarter of its shares at a price of £500 per share. Its after-tax cost of debt is 5%.

Calculate EPS and book value per share. Same question if the buy-back price is £1,500 per share. What do you conclude?

4/Rowak plc is a Syldavian industrial company listed on the Klow stock exchange. The number of shares in issue has been constant over the period at one million. The corporate income tax rate is 33%.

Calculate Rowak's after-tax ROCE and ROE in each year. What do you think?

What do you think of the fact that Rowak has never paid a dividend?

In early February 2020, the company's market capitalisation is 200 million and its managers believe the shares are worth 150 each. Rowak's chairman proposes to the board of directors that 50 million be devoted to buying back (and cancelling) outstanding shares. The programme is to be financed by borrowing at 10% before tax. The board of directors refuses. Why, in your opinion?

In March 2020, the company's market capitalisation has fallen to 90 million (still with the same number of shares in issue) and the estimated value of the share is 120. Rowak's chairman puts forward his proposal again. What do you think now?

(Figures in millions)	Revenue	Net profit	Pre-tax interest expenses	Book value of equity	Net debt	Market capitalisation
2015	170	8	9	50	60	55
2016	130	10	10	60	70	90
2017	170	11	10	71	75	152
2018	220	13	9	84	76	195
2019	230	13	7	97	70	210
2020	240	13	6	110	65	200

ANSWERS

Questions

1/*Dividend growth rate and payout ratio.*

2/*Not according to equilibrium market theory, but it could be a positive signal.*

3/*According to equilibrium market theory, you should not care; according to agency theory, you should prefer dividends.*

4/*They prefer buy-backs because paying a dividend reduces the value of the shares and therefore the value of their stock options.*

5/*The company does not gain or lose. An issue of bonus shares does not increase shareholder wealth. It can improve liquidity by increasing the number of shares in circulation. It can be a positive signal if the dividend per share is maintained.*

6/*A high dividend helps to ensure stability of the share price but in no way guarantees it.*

7/*No, since the company does not have the power to set the share price (numerator of the dividend yield).*

8/*Conceal earnings to avoid having to pay them out in dividends and thereby maximise internal financing.*

9/*No, because high dividends hold down the price of the shares on which the manager holds stock options.*

10/*The company does not have the cash to pay a cash dividend!*

11/*Because there is a transfer of value from creditors, whose claims on the company become riskier, to shareholders.*

12/*Reduces the payout ratio because there are periodic interest and principal payments to be made.*

13/*Whenever the marginal rate of return on its investments is less than the rate of return required by its shareholders.*

14/*It will increase pressure on management (more debts), and can therefore increase value.*

15/*Fundamentally, the two are the same, but the dividend goes to all shareholders whereas the capital reduction may be reserved for only some of them. The tax treatment may also be different.*

16/*EPS increases whenever the reverse of P/E ratio is higher than the after-tax interest rate on debt (or short-term investments). If the purchase price of the shares is less than the book equity per share.*

17/*An increase in risk borne by them.*

18/*If its shares are particularly undervalued.*

Exercises

A detailed Excel version of the solutions is available at www.vernimmen.com.

1/*d = 2.15 / 4.46 = 48%, dividend yield: 2.15 / 55=3.9%. Relatively high distribution policy of a group at maturity.*

2/

Fast growth has been slowing, payout ratio increasing. This is fairly logical.

Same growth pattern, but payout ratio is constant. This is surprising because the marginal rate of return has become very low (1.5% in 2020: (584 – 577) / (577 – 115)) and is surely below the cost of capital.

Cyclical company that keeps its dividend per share steady. Payout ratio is very low at the top of the cycle (5%) and very high at the bottom (>100%).

No coherent dividend policy at all.

3/*At a cost of £500 per share – repurchase amount: £125m. Associated interest costs = £6.25m. EPS after the repurchase = £125. Book value per share = £1,433.*

At a cost of £1,500 per share: EPS = £108.3; book value per share = £1,100.

4/

	2015	2016	2017	2018	2019	2020
ROCE	12.7	12.8	12.1	11.9	10.6	9.7
ROE	16.0	16.7	15.5	15.5	13.4	11.8

Returns on equity and capital employed have declined, reducing the leverage effect and the company's financial risk.

	2015	2016	2017	2018	2019
Δ earnings/Δ equity	20%	9.1%	15.4%	0	0

The dividend policy of Rowak (no dividend) was consistent with its situation until 2017 since it was getting adequate returns on reinvested earnings. This is no longer the case. Earnings are not growing, and shareholders are becoming relatively poorer.

Why would you want to pay 200 for shares that you believe are worth 150?

The proposal makes sense now because a gross disequilibrium in the market means the shares can be bought back at a price below their estimated value.

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NOTES

1 *In addition, if its by-laws allow, a company may distribute shares that it holds in its portfolio in place of a cash dividend. This is not the same as paying the dividend in its own shares.*

2 *See Fama and French (2001).*

3 *See Lambrecht and Myers (2012) and Fenn and Liang (2001).*

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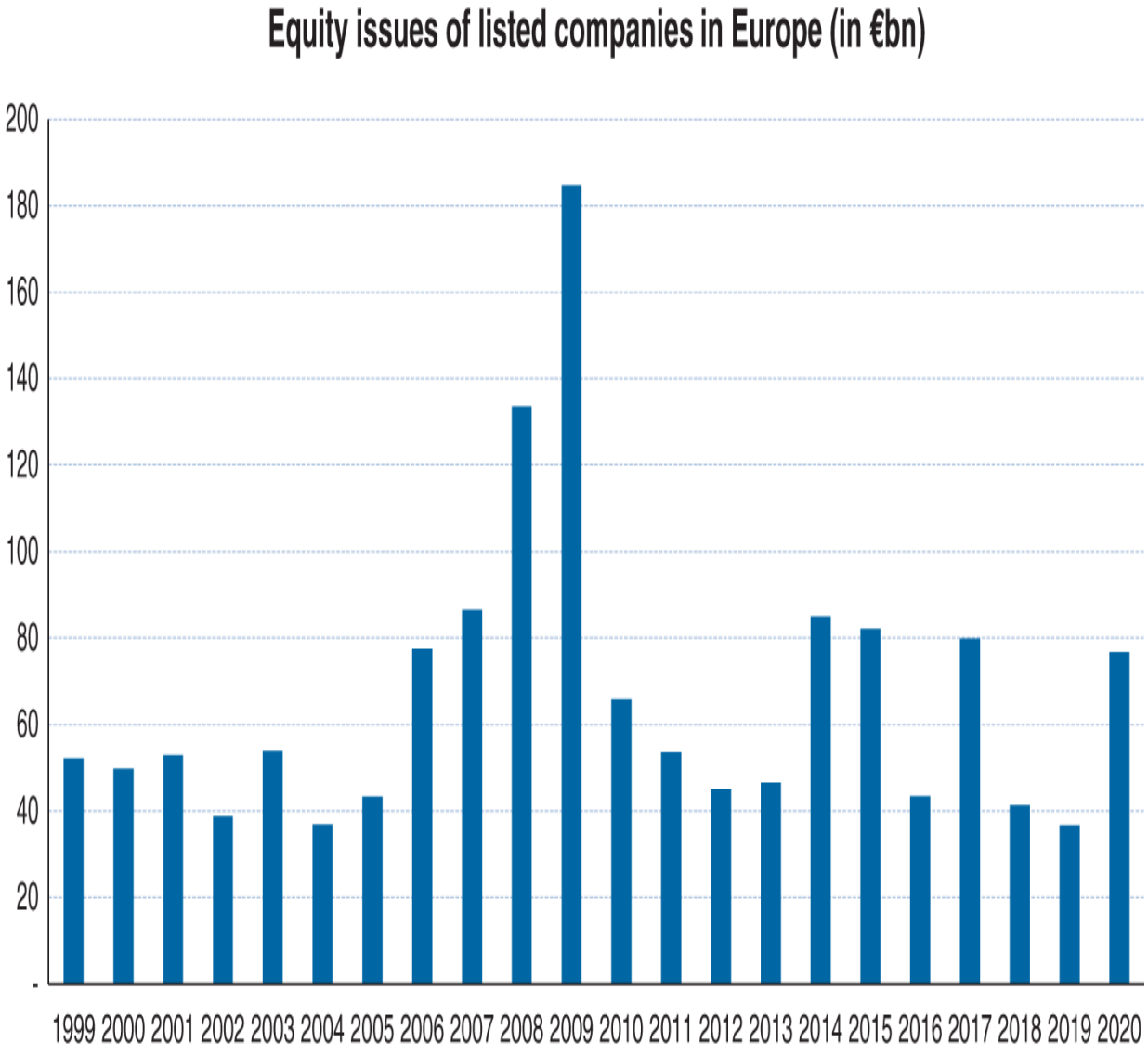
Chapter 38
SHARE ISSUES

There are no victories at bargain prices

The previous chapters have already begun assessing the reasons for equity financing. This chapter analyses the consequences for the shareholder of a share issue (or capital increase). Capital increases resulting from mergers and acquisitions will be dealt with in Chapter 46.



Source: Data from Dealogic

The strong increase in share issues in 2008 and 2009 is mainly explained by the strengthening of financial institutions' balance sheets, which had been negatively impacted by the crisis (UBS, Citi, RBS, etc.), by the financing of external growth (Carlsberg, Inbev, etc.) or refinancing of external growth initially implemented with debt (Lafarge, Pernod-Ricard, etc.), or finally by capital-raising in anticipation of future transactions (CRH).

Section 38.1 A DEFINITION OF A SHARE ISSUE

1/ A SHARE ISSUE IS A SALE OF SHARES …

A share issue is, first of all, a **sale of shares**. But who is the seller? The **current shareholder**. The paradox is that the seller receives no money. As we shall see in this chapter, **to avoid diluting their stake in the company at the time of a share issue, the shareholder must subscribe to the same proportion of the new issue that they hold of the pre-existing shares**. Only if they subscribe to more than that is the shareholder (from the standpoint of their own portfolio) buying additional control; if less, they are selling control.

Up to now, we have presented market value as a sanction on the company's management, an external judgement that the company can ignore so long as its shareholders are not selling out and it is not asking them to stump up more money. A share issue, which conceptually is a sale of shares at market value, has the effect of reintroducing this value sanction via the company's treasury, i.e. its cash balance. **For the first time, market value, previously an external datum, interferes in the management of the company.**

2/ … THE PROCEEDS OF WHICH GO TO THE COMPANY, AND THUS INDIRECTLY TO ALL OF ITS INVESTORS …

This may seem paradoxical, but it is not. The proceeds of the capital increase indeed go to the company. Shareholders will benefit to the extent that the additional funds enable the company to develop its business and thereby increase its earnings. Creditors will see their claims on the company made less risky and therefore more valuable.

3/ … WHICH IMPLIES SHARING BETWEEN OLD AND NEW SHAREHOLDERS

When a company issues bonds or takes out a loan from a bank, it is selling a “financial product”. It is contracting to pay interest at a fixed or indexed rate and repay what it has borrowed on a specified schedule. As long as it meets its contractual obligations, the company does not lose its *autonomy*.

In contrast, when a company issues new shares, the current shareholders agree to share their rights to the company's equity capital (which is increased by the proceeds of the issue), their rights to its future earnings and their control over the company itself with the new shareholders.

> A capital increase is simply a sale of shares. It implies sharing the parameters of the company. The magnitude of this sharing depends on the market value of the equity capital, but, in return, it applies to a cake made larger by the proceeds of the capital increase.

To illustrate, consider Company E with equity capital worth $1,000m split between two shareholders, F (80%) and G (20%).

If G sells their entire shareholding ($200m) to H, neither the value nor the proportion of F's equity in the company is changed. If, on the other hand, H is a new shareholder brought in by means of an issue of new shares, they will have to put in $250m to obtain a 20% interest, rather than $200m as previously, since the value of equity after a capital increase of $250m is $1,250m (1,000 + 250). The new shareholder's interest is indeed 20% of the larger amount. **Percentage interests should always be reckoned on the post money value, i.e. value including the newly issued shares.**

After this $250m share issue has been added to the $1,000m base, the value of F's shareholding in the company is the same as it was ($800m), but their ownership percentage has decreased from 80% to 64% (800 / 1,250), while G's has decreased from 20% to 16%.

We see that if a shareholder does not participate in a capital increase, their percentage interest declines. This effect is called **dilution**.

In contrast, if the share issue is reserved entirely for F, their percentage interest in the company rises from 80% to 84% (1,050 / 1,250), and the equity interest of all other shareholder(s) is necessarily diluted.

Lastly, if F and G each take part in the share issue in exact proportion to their current shareholding, **the market value of equity no longer matters** in this one particular case. Their ownership percentages remain the same, and each puts up the same amount of funds for new shares regardless of the market value. In effect, F and G are selling new shares to themselves.

This is illustrated in the table below[1] for equity values of $500m, $1,000m and $2,000m.

($m)	**Value of equity in *E***	**Value of shares held by *F***	**Value of shares held by *G***	**Value of shares held by *H***
Before share issue	1,000	800 or 80%	200 or 20%	
G sells 20% of the shares to H for 200	1,000	800 or 80%	0 or 0% (+200)	200 or 20% (−200)
H subscribes to a cash share issue of 250	1,250	800 or 64%	200 or 16%	250 or 20% (−250)

($m)	Value of equity in *E*	Value of shares held by *F*	Value of shares held by *G*	Value of shares held by *H*
G sells 20% of the shares to F for 200	1,000	1000 or 100% (−200)	0 or 0% (+200)	
F subscribes to a cash share issue of 250	1,250	1050 or 84% (−250)	200 or 16%	
F and G subscribe to a share issue increase of 250 in proportion to their ownership percentage at different initial values of equity (1,000, 2,000 and 500, respectively)	1,250	1000 or 80% (−200)	250 or 20% (−50)	
	2250	1800 or 80% (−200)	450 or 20% (−50)	
	750	600 or 80% (−200)	150 or 20% (−50)	

Section 38.2 CURRENT AND NEW SHAREHOLDERS

1/ DILUTION OF CONTROL

Returning to the examples given above, we see that there is dilution of control – that is, reduction in the percentage equity interest of certain shareholders – whenever those shareholders do not subscribe to an issue of new shares in proportion to their current shareholding.

The dilution is greatest for any shareholder who does not participate at all in the capital increase. It is nil for any shareholder who subscribes in proportion to their holding. By convention, we will say that:

> Dilution of control is the reduction of rights in the company sustained by a shareholder for which the share issue entails neither an outflow nor an inflow of funds.

Recall that if new shares are issued at a price significantly below their value, current shareholders will usually have pre-emptive subscription rights that enable them to buy the new shares at that price. This right of first refusal is itself tradeable and can be acquired by investors who would like to become shareholders on the occasion of the capital increase.

In the absence of subscription rights, the calculation of dilution of control by a share issue is straightforward:

$$\frac{\text{Number of new shares}}{\text{Number of old shares} + \text{Number of new shares}}$$

When the issue of shares is made with an issue of pre-emptive subscription rights, this calculation no longer holds. Rights allow the shareholder to partially participate in the issue of shares without spending any money, as they can sell part of their rights and participate with these funds and the remaining rights to the rights issue. This transaction does not imply any cash-in or cash-out. Hence, the dilution suffered is overestimated by the previous calculation. It is therefore necessary to compute the dilution due only to the share issue regardless of the method used (rights issue).

The simplest way to calculate real dilution is to reckon on an aggregate basis rather than per share. Real dilution is then calculated as follows:

$$\text{Real dilution} = \frac{\text{Proceeds of capital increase}}{\text{Value of equity before capital increase} + \text{Proceeds of capital increase}}$$

Dilution computed using the formula at the top of this page is sometimes referred to as apparent dilution when it is (improperly) used in the presence of preferential subscription

rights. The difference between real dilution and apparent dilution is called technical dilution as it is due to the existence of subscriptions rights.

This dilution reflects the dilution of the power of the shareholder in the company and has nothing to do with the dilution of EPS, which we will analyse in Section 38.3.

2/ ANTICIPATION MECHANISM

Take the example of a highly profitable company, entirely equity-financed, that now has investments of 100. With these investments, the company is on track to be worth 400 in four years, which corresponds to an annual internal rate of return of 41.4%.[2] Suppose that this company can invest an additional 100 at a rate of return similar to that on its current investments. To finance this additional capital requirement, it must sell new shares. Suppose also that the shareholders' required rate of return is 10%.

Before the company announces the share issue and before the market anticipates it, the value of its equity capital four years hence is going to be 400, which, discounted at 10%, is 273 today.

If, upon the announcement of the capital increase, management succeeds in convincing the market that the company will indeed be worth 800 in four years, which is 546 today, the value accruing to current shareholders is 546 − 100 = 446. There is thus instantaneous value creation of 173 (446 – 273) for the current shareholders.

The anticipation mechanism operates in such a way that new shareholders will not receive an excess rate of return. They will get only the return they require, which is 10%. If the intended use of funds is clearly indicated when the capital increase is announced, the share price *before* the capital increase will reflect the investment opportunities, and only the current shareholders will benefit from the value creation arising from them.

Some share prices that show very high P/E ratios are merely reflecting anticipation of exceptional investment opportunities. The reader will be able to observe companies whose share prices are at times so high that they cannot correspond to growth opportunities financed in the traditional way by operating cash flow and borrowing. The shareholders of these companies have placed a bet on the internal and external growth opportunities the company may be able to seize, as it may have done in the past, financed in part by issuing new shares.

Section 38.3 SHARE ISSUES AND ACCOUNTING CRITERIA

In this section, we reckon only in terms of adjusted figures. The reader is referred to Chapter 22 for the calculation of the share price adjusted for a rights issue.

Accountants and lawyers are accustomed to apportioning the proceeds of a capital increase between the increase in authorised capital (the number of new shares issued multiplied by the par value of the share) and the increase in the share premium account (the remainder). We are confident they will know how to distinguish between the two meanings of “capital increase”.

1/ SHARE ISSUE AND EARNINGS PER SHARE

A capital increase will change earnings per share instantaneously. If EPS decreases, there is said to be **dilution** of earnings; if it increases, there is said to be **accretion** (or the operation is said to be “earnings-enhancing”, which may sound better). But be careful! This dilution has nothing in common with the dilution of Section 38.2 other than the name, and is calculated differently. That one has to do with a shareholder's percentage of ownership, this other one with earnings per share.

Consider Company B, the shares of which carry a low P/E (5) justified by the company's high risk and low growth prospects and Company A, where high prospects for EPS growth justify a high P/E (20). For both companies, shareholders require an after-tax rate of return on equity of 10%, and we will assume that both Company B and Company A invest the funds raised by a capital increase at 10%; there is neither creation nor destruction of value on this occasion. For both, the value of equity capital therefore increases by the amount of the capital increase.

Company A and Company B each increase the number of shares by 50%, which, invested at 10%, will increase their net earnings. The impact of the capital increase will be as shown in the table below.

	Before capital increase					**After capital increase**			
	Market value of equity	**P/E**	**Earnings**	**Number of shares**	**EPS**	**Market value of equity**	**Earnings**	**Number of shares**	**EPS**
Company A	€3,000m	20	€150m	10m	€15	€4,500m	€300m	15m	€20 (+33%)
Company B	€3,000m	5	€600m	200m	€3	€4,500m	€750m	300m	€2.5 (−17%)

Company B's EPS decreases by 17%, whereas the transaction does not destroy value. Similarly, Company A's EPS increases by 33% but the transaction does not create value.

This demonstrates once again that earnings per share are not a reliable indicator of value creation or destruction. These changes are merely mechanical and depend fundamentally on:

the company's P/E ratio; and

the rate of return on the investments made with the proceeds of the share issue.

More generally, the rule the reader will want to retain is that any capital increase will:

mechanically lead to a dilution of EPS whenever the reverse of P/E is greater than the rate of return on the investments financed by the share issue;

be neutral whenever the reverse of P/E is equal to this incremental return; and

mechanically lead to an increase or "enhancement" of EPS whenever the reverse of P/E is less than incremental return.

It can easily be demonstrated that the earnings dilution occasioned by a capital increase at the market price is equal to:

$$\text{Change in EPS} = P/E \times \frac{\text{Capital raised}}{\text{Market capitalisation after capital increase}} \times \left(\text{After-tax rate of return} - \frac{1}{P/E}\right)$$

For Company A, any investment that generates a return per year greater than 5% (the reverse of P/E of 20) will increase earnings per share, whereas for Company B the bar is set higher at 20% (reverse of 5). Hence the appeal of issuing new shares when P/Es are high, even when the capital increase does not create value in and of itself.

> With the wisdom that derives from experience, and notwithstanding what any theory might indicate, whenever P/E ratios are high, it is the duty of managers to contemplate the possibility of carrying out a capital increase!

In the short term, it is rare for funds raised by a capital increase to earn the required rate of return immediately, either because they are sitting in the bank waiting for the investments to be made or because some period of time must elapse before the achieved rate of return reaches the required level. Consequently, it is not rare for EPS to decrease following a capital increase – but this does not necessarily mean that value is being destroyed.

Three measures of EPS dilution might be distinguished here: instantaneous dilution, with no reinvestment of the funds raised, which is seldom calculated because it holds no interest; dilution, assuming investment of the funds at the risk-free rate of interest, which is the measure that financial analysts generally calculate; and dilution with reinvestment of the funds, which is obviously the measure of most interest, but is difficult to get hold of because it requires forecasting the rate of return on future investments.

In the long term, EPS dilution should normally be offset by the earnings generated by the investment financed by the capital increase or by risk reduction via a more balanced financial structure. It is therefore necessary to study the expected rate of return on that investment, for it will determine the future course of the company's value.

2/ SHARE ISSUE AND VALUE OF EQUITY CAPITAL

To say that the book value of a company's equity increases after a capital increase is to state the obvious, since the proceeds of the share issue are included in that book value.

It is of more interest to compare the percentage increase in book value with the ratio of the proceeds of the capital increase to the market value of equity and to calculate the growth in value per share.

Let's take the example of Company C, whose equity value represents 50%, 100% or 200% of its book value. In all cases, we set the proceeds of the capital increase at the actual percentage level, which is 33% of the group's equity value before the transaction.

(in $m)	Case 1	Case 2	Case 3
Book value of equity	300	300	300
Market value of equity	150	300	600
Capital increase	50	100	200
Dilution	25%	25%	25%
Increase in book value	+17%	+33%	+66%

In case 1, because the market value (150) is below the book value of equity (300), the increase in capital requires a major effort from shareholders (25%) and leads only to a limited increase in Company C's book equity: +17%.

On the contrary, when the market value of equity is way above its book value (case 3), the same effort by shareholders in dilution terms (25%) leads to a much higher increase in book equity (+66% vs. +17%).

We can illustrate this with the example of Credit Suisse, that issued shares in April 2021. It was valued at the time of its IPO at CHF 20.1bn and had CHF 42.7bn book equity. The IPO was implemented partly through an issue of new shares for CHF 1.8bn. The new shareholders, who brought 4% of the book equity of Credit Suisse post-transaction (1.8 compared to 42.7 + 1.8 = CHF 44.5bn), have 8% of capital. The existing shareholders have had their equity per share reduced from CHF 18.3 to CHF 17.5 (–4.4%). The new

shareholders, who contributed CHF 8.65 per Credit Suisse share, now have CHF 17.5 book equity per share (hence an immediate accretion of 102%)! This is the entrance bonus that a high risk low profit bank has to offer to convince new investors to buy shares.

At a constant capital structure, the increase in equity allows a parallel increase in debt and thus in the company's overall financial resources. This phenomenon is all the more important when the company is profitable and its market value is greater than its book value. Here we link up again to the PBR (price-to-book ratio) notion that we examined in Chapter 22.

A capital increase may increase a company's financial power considerably, with relatively little dilution of control.

If market value is greater than book value, the dilution of control will be countered by a greater increase in financial resources.

If market value of equity coincides with book value, the dilution of control will be accompanied by a similar increase in the company's overall financial resources.

If market value is less than book value, the dilution of control will be accompanied by a lesser increase in financial resources.

For shareholders of a highly profitable company, i.e. of which the market value of equity is much higher than the book value, the share issue will have a very positive impact in the short term.

In the mid-term all depends on the use of the proceeds of the share issue and obviously on the return of the investment undertaken compared to its cost of capital.

Section 38.4 SHARE ISSUES AND FINANCE THEORY

1/ SHARE ISSUES AND MARKETS IN EQUILIBRIUM

A share issue is analysed first and foremost as a sale of new shares at a certain price. If that price is equal to the true value of the share, there is no creation of value, nor is any current shareholder made worse off. This is an obvious point that is easily lost sight of in the analysis of financial criteria that we will get to later on.

If the new shares are sold at a high price (more than their value), the company will have benefited from a low-cost source of financing to the detriment of its most recent shareholders. Tesla, which was able to raise money on very advantageous terms in the second half of 2020, can be cited as an example.

> Recall that the cost entailed by a share issue is neither the immediate return on the stock nor the accounting rate of return on equity. It is the rate of return required by shareholders given the market valuation of the stock (see Chapter 19 for the determination of cost of equity).

As we have seen, however, this cost is eminently variable. The sanction for not meeting it is that, other things being equal, the value of the share will decline. The company will be worth less, but in the short term there will be no impact on its cash position.

2/ SHAREHOLDERS AND CREDITORS

For a company in financial distress, a share issue results in a transfer of value from shareholders to creditors, since the new money put in by the former enhances the value of the claims held by the latter. According to the contingent claims model, the creditors of a “risky” business are able to appropriate a large share of the increase in the company's value due to an injection of additional funds by shareholders. The value of the put option sold by creditors to shareholders has a lower value. This is the reason why recovery plans for troubled companies always link any new equity financing to prior or concomitant concessions on the part of lenders.

Recapitalisation increases the intrinsic value of the equity and thereby reduces the riskiness of the company, thus increasing the value of its debt as well. Creditors run less risk by holding that debt. This effect is perceptible, though, only if the value of debt is close to the value of operating assets – that is, only if the debt is fairly high-risk.

3/ SHAREHOLDERS AND MANAGERS

A capital increase is generally a highly salutary thing to do because it helps to reduce the asymmetry of information between shareholders and managers. A call on the market for fresh capital is accompanied by a series of disclosures on the financial health of the company and the profitability of the investments that will be financed by the issue of

new shares. This practice effectively clears management of suspicion and reduces the agency costs of divergence between their interest and the interest of outside shareholders. A share issue thus encourages managers to manage in a way that maximises the shareholders' interest.

4/ SHARE ISSUE AS A SIGNAL

If one assumes that managers look out for the interests of current shareholders, it is hard to see how they could propose an issue of new shares when the share price is undervalued, as shareholders would be diluted in bad financial conditions.

If one believes in asymmetry of information, a share issue ought to be a signal that the share price is overvalued. A share issue may be a sign that managers believe the company's future cash flows will be less than what is reflected in the current share price. The management team takes advantage of the overvaluation by issuing new shares. The funds provided by this issue will then serve not to finance new investments but to make up for the cash shortfall due to lower-than-expected operating cash flows.

In practice, the announcement of a capital increase produces a downward adjustment of 3–5% in the share price. Only the current shareholders suffer this diminution of value. Some claim that this effect is due to the negative consequences of the share issue on the company's accounting ratios (see Section 38.3). We do not think so. Others explain it by invoking a market mechanism: a product sells for a bit less when there is a larger quantity of it; “You catch more flies with honey than with vinegar”. Lastly, still others explain it as being due to the negative signal that a share issue sends. The reader who wants to raise fresh capital for their company should take this effect into account and be able to respond in advance to the criticisms.

SUMMARY

The summary of this chapter can be downloaded from www.vernimmen.com.

A share issue is a sale of shares, the proceeds of which go to the company and thus indirectly to all shareholders who will therefore share future cash flows.

In the theory of markets in equilibrium, the cost of a capital increase is equal to the cost of equity given the valuation of the shares. This is neither the dividend yield nor the earnings yield (reverse of P/E). It is a forward-looking cost and one to which there is no firm commitment on the company's part. (*Ex post* it may be quite different: exorbitantly high or actually negative.) Value is created for current shareholders if the capital increase captures the value creation stemming from the new funds.

A capital increase tends to benefit lenders to the detriment of shareholders insofar as the market re-rates the company's debt to reflect the reduced risk of its share issue. A capital increase tends to favour current shareholders over new, via a transfer of value, if the rate of return on new investments is correctly anticipated. The *a priori* negative signal that any capital increase sends – namely, that the shares are overvalued – has to be countered (signalling theory). A capital increase entails a temporary reduction in informational asymmetry (agency theory).

The reduction in equity rights of a shareholder that neither puts in nor takes out funds on the occasion of a capital increase is called real dilution. In the case of a rights issue, real dilution is different from apparent or overall dilution.

This dilution of power and control is to be distinguished from the dilution (or its opposite) in the company's financial parameters in the short term. Any share issue increases EPS when the reciprocal of P/E is less than the after-tax rate of return on reinvested funds. Book value per share is diluted for current shareholders if the company's market capitalisation is less than its book value.

QUESTIONS

1/Is the issue price of the new shares important in a capital increase where each shareholder subscribes their share of the capital increase?

2/What is dilution of control?

3/When are there three different measures of dilution of control? What are they?

4/What is the purpose of subscription rights? What is their theoretical value?

5/At what price is a capital increase effected when made with an issue of subscription rights? When made without?

6/How can a company be sold by means of a capital increase?

7/What is the consequence of a capital increase on EPS in the short term? In the long term?

8/Should there be an issue of new shares whenever the share price is overvalued?

9/Why are the most profitable companies the ones that gain the most by issuing new shares?

10/Does a capital increase with pre-emptive subscription rights signal overvaluation of the shares more strongly than one without?

11/What can happen if rights trade significantly below their theoretical price? What is the limit?

12/Why are share issues a complex decision to take for family-owned companies?

13/What is most important in a capital increase?

14/In the presence of subscription rights, what is the most relevant dilution of control?

EXERCISES

1/

A company has a market value of €100m divided into 1 million shares. It proposes to raise funds equivalent to 25% of its value by issuing new shares at €75. Calculate the value of the subscription right, the apparent, technical and real dilutions, the adjustment coefficient and the subscription ratio.

A shareholder holds 90 shares of the company above. Show the bonus share aspect inherent in a capital increase of this kind.

If the shareholder does not subscribe to the new issue, what is their new ownership percentage? Calculate it in two different ways.

Show that if all shareholders subscribe to the capital increase, the issue price does not matter.

What is EPS after the capital increase if previously it was €10?

If the book value of equity was €80m before the capital increase, what is the percentage increase in it? What is the book value per share before the operation? What is it after the operation?

Answer questions (a) through (f) again assuming that, after a sharp run-up in share prices, the market value of the company has doubled. The amount of the capital increase is still €25m, but the issue price rises to €150. What conclusions do you draw?

2/Case study: Carbios share issue in May 2021.

Issue of 3m new shares without pre-emptive subscription rights:

Number of shares before the capital increase:	8.164m
Issue price:	€38
Latest price:	€41
Issue proceeds (gross):	€114m

Compare consolidated shareholders' equity (€49m) with the amount of the capital increase, the amount of the latter to market capitalisation before the operation. What do you conclude?

Calculate the real dilution entailed by the capital increase. Compare it with the increase in book equity from the share issue.

Calculate the share that new shareholders will hold in the capital and the shareholders' equity of Carbios.

What is your conclusion? Carbios is a green chemistry company that develops innovative biological processes to recycle plastics (PET) over and over again.

3/Other case studies of share issues are available on the Vernimmen.com website, including Rubis, Neovacs, Générale de Santé.

ANSWERS

Questions

1/**No, because regardless of the issue price, the shareholding is not modified.**

2/*Reduction in the equity rights of shareholders that do not subscribe to the capital increase in proportion to their current shareholding.*

3/*When there is a capital increase along with an issue of pre-emptive subscription rights. Apparent dilution (ignoring the value of the rights), real dilution (the one that matters) and technical dilution (solely attributable to the rights).*

4/*Subscription rights ensure that the current shareholders can take part in the share issue if they wish. Their theoretical value is presented on Section 25.4, 3/.*

5/*With or without rights, the capital increase is made at the value of the share. With rights because the investor's cost price must include acquired rights. Without rights because the discount, in relation to the value, is usually very small.*

6/*By having a very large capital increase with a very small issue price and hence a large value for rights.*

7/*Generally, dilution in the short term. For the long run, it depends on the returns generated by the projects that are financed.*

8/*In theory, yes. In practice, this is quite difficult to do.*

9/*Because this is the virtuous circle of the share issue.*

10/*Yes, because the substantial discount provides a cushion against a sharp drop in the market price and because the banks were unwilling to get caught up in a process that would have led to them guaranteeing a price close to the market price.*

11/*Arbitrage will take place: some investors will buy rights and short sell shares. This short sell will be repaid with the shares subscribed by the use of the rights. The lack of market efficiency is usually explained by the low liquidity of rights.*

12/*Because it leads to a dilution of control.*

13/*The profitability of the investments financed in this way.*

14/*Real dilution, because it takes into account the proceeds from the sale of the subscription rights as opposed to apparent dilution.*

Exercises

A detailed Excel version of the solutions is available at www.vernimmen.com.

1/

Subscription right = €6.25, apparent dilution = 25%, real dilution = 20%, technical dilution = 5%, adjustment coefficient = 0.9375, subscription ratio = 1 new for 3 shares held.

The shareholder has 90 subscription rights. If they sell 72 of them and keep 18, they will be able to buy 6 new shares without expending any cash. This is equivalent to receiving 6 bonus shares.

(90 + 6) / (1,000,000 + 333,333) = 0.0072 = (90 / 1,000,000) × (1 – 20%).

Since the control percentages are unchanged and the amount of increase is fixed, the price has no effect.

Before the funds raised are invested, EPS falls to €7.5.

Book value of equity increases by 31.25%. Book value per share drops from €80 before to €78.75 after.

Subscription right = €7.14, apparent dilution = 14.3%, real dilution = 11.1%, adjustment coefficient = 0.9643, subscription ratio = 1 new for 6 shares held. Book value per share after: €90.

2/*Carbios case study.*

The share issue increases the market cap by 34% but the book value of shareholders' equity by 133%.

Apparent dilution is 114 / (114 + 335) = 25%. But book equity increases by 133% for only a 25% dilution of current shareholders as equity is worth 7 times its book value.

3 / (3 + 8.164) = 26.9% of capital and 114 / (114 + 49) = 70% of equity.

It is because Carbios is perceived as a value-creating company (equity value higher than book value of equity), that the new shareholder, although contributing 70% of the equity, is entitled to only 26.9% of the shares.

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NOTES

1 *Figures in parentheses indicate cash flows: positive means an inflow; negative an outflow.*

2 *41.4% = (400 / 100)$^{1/4}$ – 1.*

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PART THREE
DEBT CAPITAL

This part addresses debt policy: features of debt and the liquidity that is to be kept on the balance sheet.

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Chapter 39
IMPLEMENTING A DEBT POLICY

Just the right mix

Once a certain level of net debt has been chosen, CFOs should think about the amount, the structuring of the firm's gross debt, the amount of cash that they want to keep, on average, on the asset side of the balance sheet, and the amount of the undrawn available credit facility that they want to keep. But as we'll see with the SEB example, implementing a debt policy goes beyond the simple choice of the parameters of the debt products issued or contracted, and includes the strategy of relationships over time between the firm and its various debt providers.

Section 39.1 DEBT STRUCTURE

Structuring a debt means defining its main parameters and negotiating them with lenders. The most important points are:

The types of lenders and guarantees:

- should loans be backed up by assets or not;
- should financing be sought on the bond market or on the bank market;
- diversifying risk among lenders (nature and number of lenders);

choice of a structure:

- choosing a maturity date and an amortisation profile;
- choosing a currency;
- choosing a type of interest rate;

related terms and conditions:

- defining a hierarchy (seniority) for repayment;
- defining appropriate legal agreements and in particular the covenants to be accepted.

1/ SHOULD LOANS BE BACKED UP BY ASSETS OR NOT?

Lenders wish to ensure that the firm will pay the interest and reimburse the loan. One of the most secure ways of guaranteeing reimbursement is to use one of the company's assets as a form of collateral. This results in heavy restrictions on the company (impossible to sell the asset), but could enable it to bring down its cost of financing and to find more financing than in the overall financing of the firm. Accordingly, we distinguish between:

Loans to companies, guaranteed solely by the borrowing company's ability to generate future free cash flows and by its current financial solidity.

Asset-backed loans, which are loans backed by a specific asset, the material existence of which constitutes both the basis and the collateral. Generally, the maximum amount of the loan is equal to the value of the collateral provided by the borrower. In most cases, it is inferior to it, since the disposal of the asset is always uncertain.

The difference between loans to companies and asset-backed loans is sometimes unclear. A loan to a company may be backed by a pledge on an asset, which only guarantees a small portion of the loan. An old asset that generates cash flows with little risk can be used as collateral to finance a new development.

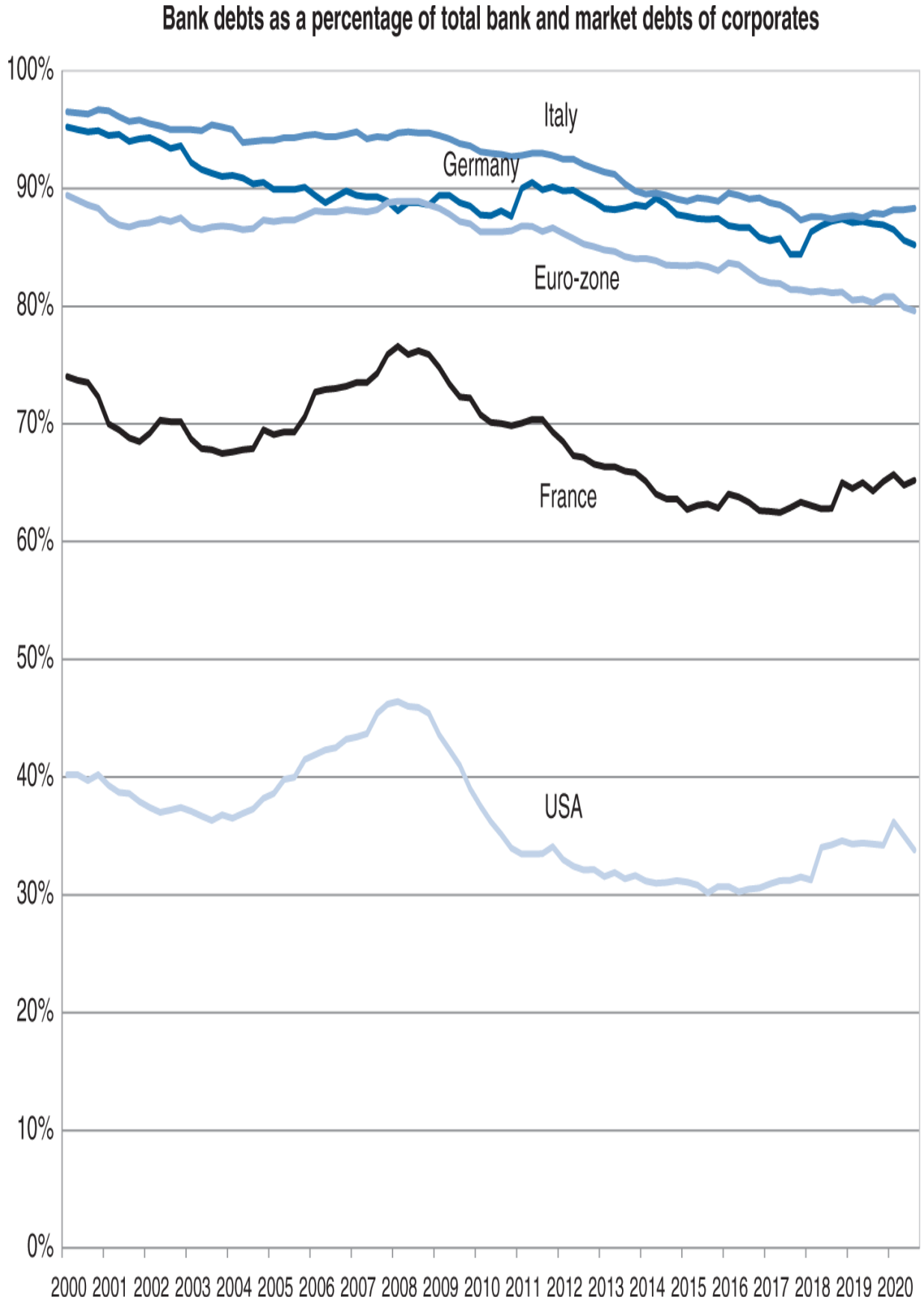
The financial manager will highlight the guarantees provided in order to isolate them and obtain cheaper financing. But let's not deceive ourselves. In a world in equilibrium, if backing a loan with an asset makes it possible to reduce the cost of financing, there is a risk that the corollary could be an increase in the cost of other financings which do not have this guarantee, and will, accordingly, be more risky.

Pushing the logic of asset-backed financing to the extreme, we get non-recourse financing and project finance (see Chapter 21). This is financing that is backed by a whole project. This technique makes it possible to isolate the different economic risks. As these risks are perceived differently by investors depending on their respective resources and preferences, the sum of the components of the financing may be less expensive than the financing of the whole.

2/ OBTAINING FINANCING FROM BANKS OR ON THE FINANCIAL MARKET

This is a theoretical choice for the small company which, in general, only has access to bank or similar financing. Nevertheless, given Basel III (and soon Basel IV) and changing banking regulations, the share of market financing in the debt of medium- and large-sized eurozone companies is tending to increase and is getting a bit closer to the situation in the US. Additionally, medium-sized companies are seeing the development of private debt placements: private placements in the US (see Chapter 21), *Schuldschein* (see Chapter 21) and now euro private placements.

Bank loans (or more generally private loans) follow a **negotiation and intermediation logic,** which runs contrary to the **market logic** of bond financing or financing using commercial paper.[1] Bond loans and commercial paper enable the company to seek financing from financial investors directly, without going through the “screen” that is created by the balance sheet of a financial institution.


Bank debts as a percentage of total bank and market debts of corporates
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Italy
Germany
Euro-zone
France
USA
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020

Although since 2010, bonds account for an increasingly large share of company financing in the eurozone, bank financing remains predominant with a share of 81%, unlike in the US, where the proportions are more or less reversed (66% for bonds and 34% for bank loans).

Source: Data from Banque de France, from national accounts

The main differences between these two major categories of financing are cost, volumes, term and management flexibility.

The costs relating to bank loans and to bonds are by nature very different. Readers may believe that the bank's intermediation cost is the only difference. In reality, the interest rate on a bank loan does not generally correspond to the real cost of financing the company. Under pressure from competitors, banks may offer loans on very attractive terms that are not linked to the counterparty risk. Their hope is that they will make money by selling the company other products (cash flow management, foreign exchange transactions, management of employee benefits, M&A mandates, etc.), which is called the “side business”.

It also means that investors have to be continually informed of the company's results and prospects and generally (though not always) require that the company or issue in question be rated (see Chapters 20 and 25), which means additional costs. The interest rate at which the market is prepared to buy the company's bonds, given its appreciation of the risk, is the real cost of financing the company.

In both cases, an intermediation fee or flat fee must be added to the cost of interest rates. Such fees are paid on signature of the loan agreement.

The amount of loans offered by banks is perfectly adapted to a company's requirements, as long as they can be drawn as and when the company needs them. On the other hand, the financial markets impose heavy restrictions on borrowers in terms of volumes. A debt security is hard to list unless it has sufficient liquidity for investors, who want to be able to buy it and then sell it easily if necessary. The necessary minimum is often €200–300m. Nevertheless, SMEs can issue directly or via investment funds, listed bonds for amounts of between €5m and €20m. Unfortunately, the liquidity of a €5m bond will be non-existent on the secondary market, preventing large funds and institutional investors from financing SMEs. Private investors and some specialised funds will be the main holders of such bonds. This moves away from a market logic, but remains in a disintermediation logic.

The bond market generally offers financings over a longer period than those offered by the bank market. Bank loans rarely have a maturity of over five years (with the possibility of an extension of 1 or 2 years at the hand of the banks), while it is possible for companies to issue bonds over 12 years, or even longer, especially in dollars or in pounds sterling. Additionally, bonds have a longer duration because they are practically all reimbursed at the end of the loan term (bullet repayment) and not in instalments like most bank loans.

While bank loans can normally be obtained relatively quickly, preparations to tap the debt market can take weeks if the issuer is a first-time issuer, and there is no guarantee of success. The need to provide investors with information explains the length and difficulty of the process. Moreover, the unpredictable nature of the market sometimes results in major uncertainty in terms of the success of the debt issue. It's also ill-advised to issue debt during periods of tension on the financial markets. However, most of the time, groups with a good rating (investment grade) can issue amounts of several hundreds of millions of euros or dollars or even several billions in a few hours on the markets.

The principle of bilateral banking arrangements naturally offers a greater availability of funds. Similarly, for commercial reasons, banking terms can be renegotiated if the company's situation deteriorates or improves. This is extremely complicated and costly for listed debt securities, which are held

by a multitude of investors who will all have to be invited to a general meeting where they will have to approve these changes by a given majority.

Additionally, **bank loans are generally more restrictive in terms of restrictions on the borrower**. In particular, they **impose compliance with covenants** (Section 39.2), while documentation relating to bond loans is substantially less complex and standardised.

On the other hand, a bank loan offers additional flexibility by allowing borrowers to defer drawing down funds, i.e. to defer the moment when the funds are made available and when interest starts to accrue. Borrowers then pay a commitment fee (or non-utilisation fee). This is not possible for a bond loan as the funds are paid to the issuer immediately after the close of the issue. Private debt placements offer a certain amount of flexibility in this regard.

> The treasurer of a group may choose to tap the bond market, even if the cost is higher, so as to avoid falling into the hands of banks and to retain flexibility.

3/ CHOOSING A MATURITY

The choice of a maturity depends on how liquid the company is (see Chapter 12).

Naturally, the treasurer will base decisions on the forecast cash flow budgets. Let us assume that they are certain they will have to invest €10m during the year under way and that the company's cash flows will only be positive from the third year. In this case, it would be worth looking for financing where no capital has to be reimbursed during the first two years; for example, a bank loan with deferred repayment or a five-year bullet bond.

> The distinction between long-, medium- and short-term financial resources corresponds to the major periods of the treasurer's forecasts, and accordingly to the categories of information that they have.

The treasurer will look at these issues separately by drawing up a financing plan with different maturities. Once this has been done, they can carry out arbitrages between short-, medium- and long-term financing, taking advantage of specific opportunities on one of the types of loans. First and foremost, care must be taken not to create a “debt wall” by grouping together too large an amount of repayments on any given year.

The treasurer will first rely on the least expensive resources for the most foreseeable portion of their financing requirements. They will then adapt the level of credit on the basis of loans obtained the most quickly (credit line, revolving loan, overdraft), as new information comes in. When major funds have to be allocated without being anticipated in advance, the treasurer will rely on immediately available resources (cash, bridge financing, etc.), then gradually replace them with less expensive or more structured resources (maturity, guarantees, etc.).

4/ CHOOSING A CURRENCY FOR DEBT

As we'll see in Chapter 51, taking out debt in a foreign currency can turn out to be a good way for the company to reduce its exposure to the foreign exchange risk. Accordingly, the treasurer of a group operating on an international scale should add the foreign currency dimension to their financing plans. But taking out debt in a foreign currency when most of the company's business is in the eurozone on the pretext that interest rates are lower than in the eurozone is a serious mistake! It is speculating that the difference in interest rates will not be set off, or even worse, by a depreciation of the euro against this foreign currency between now and the loan's maturity. It is taking a very big foreign exchange risk for a very small interest rate saving, it is playing against economic theory and it is certainly not the type of behaviour that shareholders signed up to finance when they invested in the company.

5/ CHOOSING BETWEEN A FIXED RATE AND A FLOATING RATE

The choice between a fixed and a floating rate is a lot more complex than it seems.

Firstly, you should remember that it is quite different from the choice of a maturity. Short-term fixed-rate debt (e.g., USCPs or NEU CPs) is floating-rate debt because the interest rate changes when a new debt is taken out to replace the previous one. Medium- and long-term loans can be taken out at a floating rate. This is generally the case for bank loans indexed to a short rate like the 1.3- or 6-month Euribor, regardless of their maturity. Additionally, through swaps (see Chapter 51), the financial markets offer a simple way of moving from fixed to floating rates and the other way around.

In order to make the best choice, financial directors have to focus on other criteria – minimising costs, reducing risk, optimising value and following the siren's call of their expectations.

Studies show that for the past 35 years, companies that took out debt on the basis of short rates (so at floating rates) were winners in terms of costs. Nevertheless, generally, taking out debt at a fixed rate is seen as playing it safe, as the company knows today what its expense on the income statement will be for the years to come. But this is forgetting that when interest rates fall (generally during periods of crisis), the value of the debt at a fixed rate will increase, thus reducing the value of equity, even if effectively there is no impact on the income statement. In this case, accounting that does not record the opportunity costs on the income statement does not shine any light on the decision made.

It is, however, difficult for a heavily indebted company, or a company operating in a cyclical sector, to take the risk of interest rates rising, which would increase its costs. For such companies, a fixed rate is a form of insurance policy. On the other hand, a company in a sector protected from inflation (because its prices are more or less indexed to it, such as energy, real estate, highways, etc.), can take on the risk of a variable rate. In fact, most of the time, the rise in interest rates is due to a rise in inflation: what it loses on its financial costs, it recovers on its operating income.

In the end, financial directors' expectations of rising or falling interest rates will obviously have a major influence on their choice. Under the cover of good management, they become speculators, taking out debt at a floating rate when they think that interest rates are going to fall and at a fixed rate when they find that current interest rates are very low. This is speculation,

because if they are wrong, the company will suffer the consequences, which include a rise in the future cost of financing and an opportunity loss on the cost of its present debt.

Bank loan agreements contain covenants which set out the obligation to hedge part of the interest rate risk when the company takes out debt at a floating rate. In this case, the cost of hedging must be added to the real cost of the loan. The interest rate risk is theoretically described in the notes to the accounts of the company, and its hedging policy must also be set out.

The result of these considerations is often an arbitrary proportion (50–50, 2/3–1/3) of fixed and floating rates.

6/ DEFINING THE SENIORITY OF REPAYMENTS

A creditor that has no guarantee is called a **chirographic creditor**. It is also possible to introduce, legally or contractually, “less advantaged” creditors than chirographic creditors. Such creditors are known as **subordinated creditors**. If the company is liquidated, they will be reimbursed after the senior creditors and after the chirographic creditors, but before the shareholders. Creditors that will have priority over subordinated creditors are called senior creditors. Senior debts may be unsecured or even privileged if they benefit from a specific guarantee (pledge, collateral, etc.).

> The existence of subordinated creditors constitutes a guarantee for the other creditors, in the same way as equity does. They have provided funds which have increased the company's assets, and thus its cash flows, but they'll only be reimbursed after the other creditors. Accordingly, they help to improve the company's solvency.

Of course, in exchange for accepting additional risk, subordinated creditors will **demand a higher interest rate** than the other creditors, who run less of a risk, and especially the holders of senior debt.

> Subordinated creditors make it possible to share out risks and remuneration in terms of debt, with each creditor choosing the level of risk that it wants to run.

Within the same debt category (subordinated debt, chirographic debt), it is important that the legal features are similar (the notion of *pari passu*).

Subordination can be contractual, i.e. written into the debt or maturity contract: for example, a 10-year debt will *de facto* be subordinated to a shorter debt because, by definition, the shorter debt will have to be repaid before the longer debt. Finally, subordination may be structural if one debt is on a holding company that does not generate cash flow, while another debt is on an operating entity and will be more easily repaid by the cash flow of the operating entity.

Section 39.2 COVENANTS

Covenants are undertakings to do or not to do something. Any breach of a covenant results in a debt becoming immediately due, or even directly the default of the company on this debt, which often leads to default on other debts (through the cross-default mechanism).

The addition of covenants is generally reserved for the most indebted companies (non-investment grade if they are rated), while companies with low debt levels manage to force banks or bondholders to do without them. The level of severity of covenants also depends on the intensity of competition between banks and their willingness to lend at a given time.

1/ CLAUSES OVER CORPORATE INVESTMENT AND PRODUCTION POLICIES

The purpose of such covenants is chiefly to protect debtholders against the possibility that the firm will substitute more risky assets for the existing ones or will simply reduce the total assets. Any investment in other companies, mergers, absorption or asset disposals are either restricted or subject to approval by the debtholders.

In some cases, inventories, client receivables, the securities of certain subsidiaries or the equipment the issue served to finance are given as collateral (pledge). Some covenants restrict the granting of certain assets as collateral for future debt (negative pledge).

2/ CLAUSES OVER NET DEBT AND SUBSEQUENT DEBT ISSUES

Any unforeseen, subsequent issue of equal or higher-ranking debt reduces value for existing debtholders; yet it would not be in the interests of either the current bondholders or the shareholders to rule out any further debt issues. To protect themselves against a reduction in the value of their claims, debtholders can impose limits on the amount of net debt and the nature of the new debt issued based on certain ratios:

$$\frac{\text{Net financial debt}}{\text{Equity}}, \frac{\text{Operating income}}{\text{Interest expenses}}$$
$$\frac{\text{Net financial debt}}{\text{EBITDA}}, \frac{\text{Receivables}}{\text{Payables}}, \text{ etc.}$$

If the limits, assessed at least once a year at the closing of the accounts, are exceeded, then the loan becomes immediately due and payable (this is known as the financial maintenance covenant). The excess may result from additional debt or a deterioration in the company's results.

In practice, these are chiefly *rendez-vous* clauses that force the company to arrange a restructuring plan with its creditors to contain the risk to the latter, which increases with the financial distress of the company. In addition, waivers (i.e. the fact that banks may allow the borrower not to respect covenants) may be granted against a specific increase in rates or a waiver fee, thereby increasing the remuneration of the lender (as the borrower has become more risky).

Alternatively, or jointly, the spread on the loan can be moved up or down following a margin grid, depending on the level of the covenants, to reflect in the remuneration of lenders the variation in the company risk.

3/ CLAUSES OVER DIVIDEND PAYMENTS

These covenants are designed to avoid the massive dividend distributions financed by increases in debt or asset disposals that make the lenders poorer (see Chapter 34). For example, they can link dividend distribution to a minimum level of equity during the life of the debt. Similarly, they can restrict or rule out the distribution of reserves or share buy-backs.

4/ CLAUSES CONCERNING CONTROL OVER THE BORROWER

In the event of a change of control at the borrower, the lenders may reserve the right to request that the amounts owed to them be repaid. Their goal is

to be in a position to negotiate should this change in shareholders result in an increase in the risk on their loans, so that they can re-evaluate the terms, or, if necessary, pull out completely.

* * *

Covenants are often the bugbear of the financial director as they are sources for reducing room for future manoeuvre. There are some very solid groups that, on principle, refuse to agree to covenants. Others do not have this luxury and they negotiate them reluctantly with lenders, hoping they will never have the humiliation of having to announce that they have been unable to comply with them.

Section 39.3 RENEGOTIATING DEBT

First of all, we'll eliminate cases of extreme financial difficulties which we will deal with in Chapter 48.

During the ordinary course of business, it may be in the company's best interests to renegotiate the terms of its loans, either to extend or reduce the term as a result of changes in its free cash flows (change in the economic situation, disposal or acquisition of major assets). It could also be seeking to take advantage of better market conditions (term, interest rates), as for example since 2014; or it may want to get rid of its covenants if its financial situation has improved.

The company can, finally, be forced to negotiate in order to prevent the lenders from calling in the loan in advance if the covenants are not complied with, which most often involves the payment of ad hoc fees, an increase in the interest rate and/or the provision of new guarantees.

Roberts and Sufi (2009) have shown that in the US, the probability that a loan will be renegotiated before the end of its term is 27% for loans of less than one year and 72% for loans of between one and three years, 94% for those between three and five years and close to 100% (98%) for those of over five years.

For bonds, negotiations are more complicated. Usually, the bond loan is held by a larger number of investors than there are banks involved in a bank loan, and over which the company has not the power of negotiation, which for a bank is called side business (see Section 39.5).

There are more or less four ways in which a bond debt can be reimbursed or renegotiated:

buy up the bond on the market or through a public offer (the term used is then liability management or LM), which means paying a bit more (around 1%) than its market price and provides no assurance of being able to buy up all of the bonds issued. In practice, the success rate of such offers is generally around 30%;

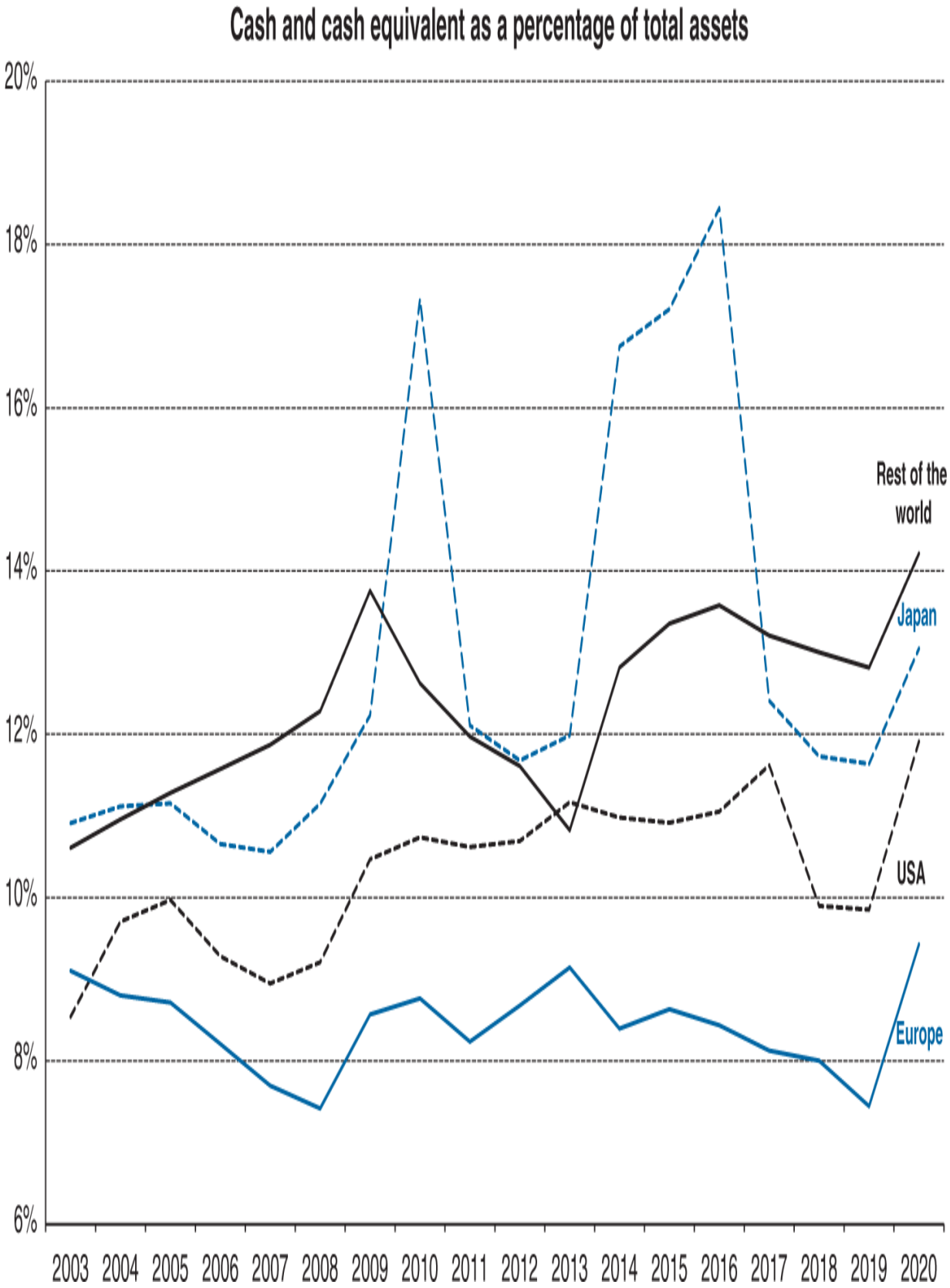
offer to exchange existing bonds for new bonds to be issued for a longer term or with a lower interest rate. But the reader should not be misled. If interest rates have fallen since the issue of the initial bond, the exchange for bonds issued at a lower interest rate will not make it possible to pay a lower yield to maturity over the residual term of the initial bonds, as these will have to be bought at above the nominal. The Altarea exercise at the end of this chapter illustrates this point;

invite the bondholders to attend a meeting at which they will vote on the plan to modify the initial bond contract. They are paid a fee (consent fee) in order to encourage them to vote. Once a majority is reached (which depends on the legal regime under which the bond is placed), the new provisions apply to all of the bondholders, even those who abstained or who voted against.

use a contractual provision allowing for early redemption of the entire bond issue (*make-whole call*), often in return for the payment of a significant premium.

Section 39.4 WHY KEEP CASH ON THE BALANCE SHEET?

Since the early 2000s, the share of cash and cash equivalents on companies' balance sheets has continued to grow:



Source: Data from Factset

Part of this cash is not the result of a choice but of a constraint and it is not really available. Some funds are blocked in countries that have strict foreign exchange control rules, other funds involve the payment of additional taxes (withholding taxes) before they can be transferred to the parent company, and other funds are serving as deposits, guarantees, advance payments, etc., which in some countries have to be blocked in special accounts.

And even if funds are not blocked, advance payments by customers will be used to make the products or services orders and to pay suppliers. Accordingly, they cannot be used to repay debts, especially in sectors where activity fluctuates.

Alongside these restrictions, conscious choices have to be made:

firstly for operational reasons: to cover the cash requirements of the different sites (stores, outlets, etc.) or to cover seasonality in working capital;

the liquidity crisis in the autumn of 2008 showed that cash can disappear as quickly as water in sand. A lot of financial directors who spent sleepless nights worrying about their companies' cash shortages have vowed that this will never happen to them again and have set up precautionary cash reserves. The Covid-19 crisis has demonstrated that corporates were better prepared. It is also clear that the more difficult it is for a firm to tap the financial markets in normal times, the more it will tend to accumulate cash on its balance sheet;

paying back debts early by using surplus cash can trigger the payment of dissuasive penalties and it sometimes happens that a debt contracted in the past at a fixed rate costs less than what the cash can earn, which will not encourage the financial director to use one to pay off the other;

having cash on the balance sheet ensures that the firm will always be in a position to seize investment opportunities which may arise unexpectedly; Frésard (2010) has shown that companies that keep a lot of cash on the asset side of their balance sheet tend, in the following years, to win market share from their “poorer” competitors;

clients, suppliers and workers can only but be impressed by large amounts of cash (public works, defence, etc.). This is why Tereos keeps around €655m in cash on its balance sheet (with gross debt of €3.2bn), so as to reassure third parties of its liquidity, whilst its rating (B+/BB–) is non-investment grade;

for companies with a lot of R&D or intangible assets (pharmaceuticals, technology), having cash on the balance sheet partly counterbalances the fluctuations in cash flow and reduces the risk of investment for the shareholder;

investment does not necessarily immediately follow divestment. Hence Sanofi in May 2020 has explained to the market that it would keep the €10bn from the disposal of its stake in Regeneron for future acquisitions that took place end-2020 and in 2021.

As it is unlikely that the world is getting any less volatile than it is today, cash on the balance sheet will still be a popular choice for many years to come. However, this should not justify excesses, such as keeping large sums on the balance sheet in a permanent way that could be better used in the rest of the economy (see Chapter 36).

Instead of holding cash, firms can opt to keep some undrawn revolving credit facilities (RCF) to maintain the required flexibility and allow for sufficient liquidity.

Section 39.5 THE LEVERS OF A GOOD DEBT POLICY

We can't end this chapter without giving readers some advice drawn from our experience, from observation, but also from common sense. All of this advice is stamped with the seal of flexibility. We use the example of SEB as an illustration.

It is preferable to concentrate most of a firm's banking business on a limited number of banks with which long-term and trusting relationships can be built, rather than dispersing this business among a myriad of banks that may be frustrated not to work sufficiently with the company.

In addition to the loans that they grant (which usually tend not to be very profitable), banks appreciate it when the firm gives them other business, which increases the earnings the banks can get out of the relationship without necessarily requiring additional costly commitments in equity: the side business. It is not unlimited, sharing it out among too many banks will make none of them happy. Concentrating on 3–10 banks (depending on the size of the group and its international deployment) will, on the other hand, provide these banks with additional, welcome earnings and help to strengthen the relationship. They will then be motivated to spend more time analysing and will better understand the company, and this in turn will help them to feel at ease. The more they understand its day-to-day operations, its management, its strategy and its development, the more they will be inclined to lend to the company.

In this way, SEB reduced the number of banks involved in its syndicated loan from 40 to 9 in 2004, and then to 7 in 2006, before climbing back up to 8 in 2016 and at the same time increasing the amount of the loan from €300m to €960m. This only serves as backup to the €1bn commercial paper program.

It is prudent to diversify a company's sources of debt financing among bank debt, bonds, commercial paper, private placements, etc. as the new and restrictive liquidity regulations to which banks are subject limit their capacity to lend, particularly over the medium and long term. Additionally, one market may close while others remain open as long as the borrower is already known to the active investors on these markets.

SEB complemented its existing sources of financing with banks and the commercial paper market (peak of €975m in 2020) by tapping the listed bond market (€1,650m in four tranches with maturities of 2021, 2022, 2024 and 2025) and the private bond market (€625m issued in Schuldschein bonds, maturing between 2021 and 2026, subscribed to by German, French and Asian investors).

It is a good idea to maintain cash reserves that can be drawn on in order to be able to cope with the unexpected, whether the result of changes in the economic situation or acquisition opportunities. In this area, the financial director should take good heed of the advice given by St Matthew: “Watch ye, therefore, for ye know not the day nor the hour.”

Which also means that the company bears a cost for this flexibility, since the medium-term resources drawn down and not used to finance capital employed, and thus booked as cash, do not earn the same interest rate as they cost. Similarly, commitment fees have to be paid on credit lines that have been confirmed but not drawn down. But, like any insurance policy, flexibility has a financial cost.

Although SEB had bank and financial net debt of €1,187m at the end of 2020, it also has confirmed medium-term credit lines of around €1,010m that have not been drawn down, as well as €2,432m in cash. That's enough for it to go shopping or to cope with any shocks it may encounter. This certainly made it easier for SEB to cope with the Covid-19 crisis.

It is advisable to adapt the maturity of debts to the likely profile of free cash flows in order to avoid feeling too much pain during cash crises, even if that means paying more for a loan because long-term borrowing is generally more expensive than short-term borrowing (see Section 19.6).

For SEB, extending the maturity of financing mainly meant heavily reducing the share of commercial paper (see Section 21.1), resources which are by definition short term. The issuance in 2017 of €500m of 7-year bonds allowed them to reduce this type of financing by 60%. Reducing them does not mean cutting them out altogether. The €1,000m programme was never stopped, so that investors on this market would not get the unpleasant impression that SEB only calls on them when it needs them and is unable to secure resources elsewhere. €975m was consequently issued in 2020.

It is advisable to renegotiate with zeal the covenants that lenders require so that the company is able to maintain room for manoeuvre.

Since 2006 SEB does not have covenants anymore. The low level of risk of its activities and its low level of debt explain this situation.

It is wise to use asset-backed financing with moderation, as the lower cost of financing such loans is often apparent and the real cost is the difficulty of obtaining standard financings. Similarly, sophisticated products (convertible bonds, deeply subordinated securities, etc.) are rarely without a downside: complexity, arbitrage on the share price, and so on.

Obviously, having an intelligent financial policy is a lot easier when the company is performing well operationally and its debt level is low. Limiting the number of banks and concentrating debt on long-term loans with uncomplicated bank documents becomes a lot less easy for groups that are heavily indebted. Having said that, it is when business is ticking over nicely that it is important to be rigorous and demanding, because when the situation deteriorates, it's often too late to do things properly.

Similarly, diversification of sources of financing is more complicated for smaller groups given that it is harder for them to gain access to the bond market or even to commercial paper. But other sources of financing remain available (factoring, leasing, private placements).

> The diversification of sources of financing is not without cost. Management of the various sources can be complex and there may even be a liquidity discount if market products are issued in volumes that are too low. It is thus important to strike a balance.

SUMMARY

The summary of this chapter can be downloaded from www.vernimmen.com.

Once a financial structure has been chosen, the task of the treasurer is to reduce the cost of debt, while retaining as much flexibility as possible.

To manage the company's net debt and raise funds in line with the main items on the cash flow budget, the treasurer can:

use the assets on the balance sheet or not;

negotiate OTC products with banks or tap the financial markets.

Bank financing is a question of negotiation and intermediation, whereas primary market financing is governed by market forces. The choice for SMEs between bank financing and tapping the markets is a theoretical one, given that bank financing is in a much stronger position and due to the virtual impossibility of SMEs being able to use market products, given their size.

Using collateral definitely reduces the cost of a loan and may sometimes allow a company to obtain financing that it could not get based only on its intrinsic qualities. Using collateral makes it possible to isolate the various economic risks.

Legal or contractual provisions may rank certain creditors behind chirographic creditors, thus making them “subordinated creditors”. This means that if the company is wound up, they are paid after the preferred creditors (who have access to a specific guarantee), and after the chirographic creditors (these two categories of creditors being “senior” in comparison with the subordinated creditors), but before the shareholders. In exchange for taking on a greater risk, subordinated creditors demand a higher interest rate than the holders of less risky debt, in particular the senior creditors.

Other important debt parameters include the type of interest rate, fixed or floating, the choice of which depends, often wrongly, on the financial director's expectations of what interest rates are going to do.

Once a bank debt has been contracted, it is quite often renegotiated. This is because either the company, having improved its financial

situation, wishes to reduce the cost of its debt or to modify the duration, or because it is forced to do so because it has failed to comply with the covenants.

A good debt policy is a policy that leaves cash on the balance sheet in order to be able to deal with the unexpected and to reduce risk, to reassure the company's partners and to enable it to seize investment opportunities.

Finally, the financial director would be advised to have close relationships with a limited number of banks to diversify the company's sources of financing among the different providers of debt, to adapt the maturity of debts to the likely profile of cash flows, and to agree to covenants and asset-backed financings very cautiously, in order to retain as much room for manoeuvre as possible.

QUESTIONS

1/What is the point of backing a loan with an asset?

2/What are the main restrictions on issuing bonds on the market?

3/Why could it be a good thing for a group to issue bonds?

4/What is the point of using subordination when raising financing?

5/When should a treasurer be more inclined to use market products?

6/What is a covenant? Provide a theoretical example of the usefulness of covenants.

7/Is a covenant more of an obstacle to doing or a clause that encourages discussion among the creditors?

8/What is the negative side effect of backing up a financing with an asset?

9/Are there more covenants in a bond loan than in a bank loan? Why?

10/Why do companies keep cash on their balance sheets?

11/A treasurer has to invest cash, but over a period of two years. Should they opt for a fixed or a floating rate? Why?

12/What is the treasurer who takes out debt over five years at a fixed rate betting on? Why?

13/How are reasoning in terms of value and reasoning in terms of cost on the income statement in opposition to each other with regard to the choice of a fixed or a floating rate for debt?

14/What is the limit on the amount of cash that should be kept on the balance sheet?

15/Is it a bad thing to renegotiate debt?

16/Is it more complicated to renegotiate bond debt than to renegotiate bank debts? Why?

17/Does diversifying sources of financing by debt come without cost for the company? Should it be avoided? Why?

EXERCISE

Altarea had issued €500m of bonds in 2017, maturing in July 2024, with a coupon of 2.25% and a redemption at par. In December 2020, Altarea proposed to redeem these bonds by issuing new bonds at the current market rate for this level of risk, i.e. 1.75%, maturing in December 2027.

Is the Altarea 2017 2.25% bond trading above, below or at par at the end of 2020? Why or why not?

What is the difference between the price of the 2017 2.25% bond and its nominal value in December 2020, given the interest rate in force at that time for a borrower such as Altarea with a residual maturity of 3.5 years?

On what condition can the holders of the 2017 2.25% bond agree to sell it to Altarea?

If Altarea obtains the redemption of 100% of the 2017 2.25% bonds and finances itself by issuing December 2020 1.75% bonds, could you say that from December 2020 to July 2024 (i.e. over the residual life of the 2017 2.25% bond), Altarea benefits from an interest rate of 1.75% on this €500m debt contracted in 2017? Why?

Under what condition could you say that Altarea benefits, in total, from a cost of debt reduced to 1.75% from December 2020 to July 2024 on the €500m borrowed in 2017? Does this seem realistic to you? Why or why not?

What is the cost to Altarea of the December 2020 1.75% bonds from July 2024 to July 2027, i.e. beyond the life of the 2017 2.25% bonds that they replace?

What are the two interests that explain why groups proceed, under conditions similar to those of Altarea, to repurchase or exchange their previously issued bonds?

ANSWERS

Questions

1/*To obtain financing that the constrained financial structure of the company might not enable it to obtain at a favourable rate, because the risk for the lender is lowered.*

2/*Minimum size of the bond loan, bullet repayment, which could amount to a large sum when the time comes, often mandatory with a rating.*

3/*Diversify creditors, obtain long-term financing that the restrictions of Basel III make it more difficult for banks to provide.*

4/*Share the risk in line with creditors' appetite and get tighter financing costs by having customised the loans.*

5/*To take advantage of a window of opportunity on the markets when prices are temporarily abnormal.*

6/*A restriction that the lenders place on shareholders so that they cannot increase the risk of the lenders.*

7/*Covenants force management/shareholders to approach lenders to renegotiate loan agreements if they wish to exceed the limits set in these covenants.*

8/*A rise in the cost of the company's other financings because the other lenders do not have access to the collateral that this asset represents, therefore their risk is increased.*

9/*More in bank loans that are held by a limited number of banks, which have the material means to monitor them and possibly renegotiate them, than in bonds which are often held by tens or hundreds of bondholders.*

10/*As a precautionary measure; because there is friction with cash being sent to the head of the group in large international groups; to reassure the company's partners.*

11/*At a floating rate so that the asset, in the event of a fluctuation of market interest rates, does not lose any value at the time when the treasurer has to sell it, if this happens before the asset matures.*

12/*On a rise in interest rates, because if they were betting on a drop, they would take out debt at a floating rate.*

13/*The value of a debt at a floating rate is stable at the cost of variability in the interest rate, which is on the income statement. The annual interest of a debt at a fixed rate is stable at the cost of variability in the value of the debt at a fixed rate. Accordingly, you have to choose your source of instability, knowing that in accounting, fluctuations in the value of debt are only recognised, at best, in the notes to the account.*

14/*The pressure of shareholders who say that enough is enough and that the surplus cash should be returned to them (see Chapter 36).*

15/*No, it is good management when the company takes the initiative following an improvement in its financial situation or in financial conditions on the market.*

16/*Yes, because there may be a lot more investors holding a portion of the company's bond debt than there are bankers holding bank debt, which will complicate the renegotiation process.*

17/*No, for example, obtaining a rating, or continuing to issue commercial paper when the company temporarily no longer needs these funds. But this is the price to pay for keeping room for manoeuvre.*

Exercise

A detailed Excel solution to the exercise is available at www.vernimmen.com.

The 2.25% bond is trading above its par value because rates in December 2020 for a borrower like Altarea have fallen to 1.75% for an average duration of 7 years, and even less for a residual duration of 4 years (2024).

The spread between the price and the nominal is the present value, over the remaining life of the bond, of the difference between the coupon rate of 2.25% and the market rate (1.75%), applied to the nominal value of the bond, all discounted at the current market rate.

Provided they are offered a (small) premium on the price of the bond quoted on the secondary market. Otherwise, they have no interest in proceeding with a sale.

No, because Altarea will not buy back the bonds at 100% of the nominal value of €500m, but at a higher price, i.e. the market value plus a small premium.

This would only be possible if Altarea could buy back its debt on the basis of the nominal amount of €500m. This is totally unrealistic, as it would require bondholders to accept a redemption below the market value of their bonds.

Beyond the life of the initial 2017 bond, the cost to Altarea of the 2020 bonds is 1.75% per annum.

Extending the maturity of the debt to improve the liquidity of the companies and taking advantage of what they perceived to be low interest rates in 2020 to lock in low interest rates for a relatively long period of time, 7 years for Altarea, rather than waiting until the maturity of the initial bonds (2024 for Altarea) to refinance at interest rates that may be higher at that time.

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NOTE

1 We note that financing using commercial paper is rather hybrid by nature, since even though this is a market financing, it requires de facto confirmed bank credit lines for an equivalent amount (see Chapter 21).

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Section V
FINANCIAL MANAGEMENT

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PART ONE
CORPORATE GOVERNANCE AND FINANCIAL ENGINEERING

In this part, we will examine the issues an investment banker deals with on a daily basis when assisting a company in its strategic decisions, which include:

organising a group;

launching an IPO (initial public offering);

selling assets, a subsidiary or the company;

merging or demerging;

restructuring and more.

We do hope that our readers will not spend whole nights on these topics, unlike investment bankers!

This section also sets out some ideas on the financing of start-ups. This might not be what investment bankers like doing most, unless they have to reinvent themselves as an entrepreneur, investor, or business angel!

As you will soon realise, financial engineering raises and solves many questions of corporate governance.

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Chapter 40
SETTING UP A COMPANY AND FINANCING START-UPS

A really big adventure!

All groups were once upon a time start-ups, and some were even set up in such improbable places as a maid's room (NRJ), a garage (HP) or a university dormitory (Facebook). The most talented of entrepreneurs, the luckiest, the hardest working, with the ability to learn from failures and with vision, will succeed in creating a group that survives, but the vast majority will fail. Fortunately, this fact does not prevent new entrepreneurs, every year, from embarking on this adventure. We've written this chapter for them so that they can avoid making bad financial choices that could put their entrepreneurial adventure in danger. As for anyone else who reads it, we hope that we'll have sown a tiny seed which perhaps one day will grow into something bigger.

Section 40.1 FINANCIAL PARTICULARITIES OF THE COMPANY BEING SET UP

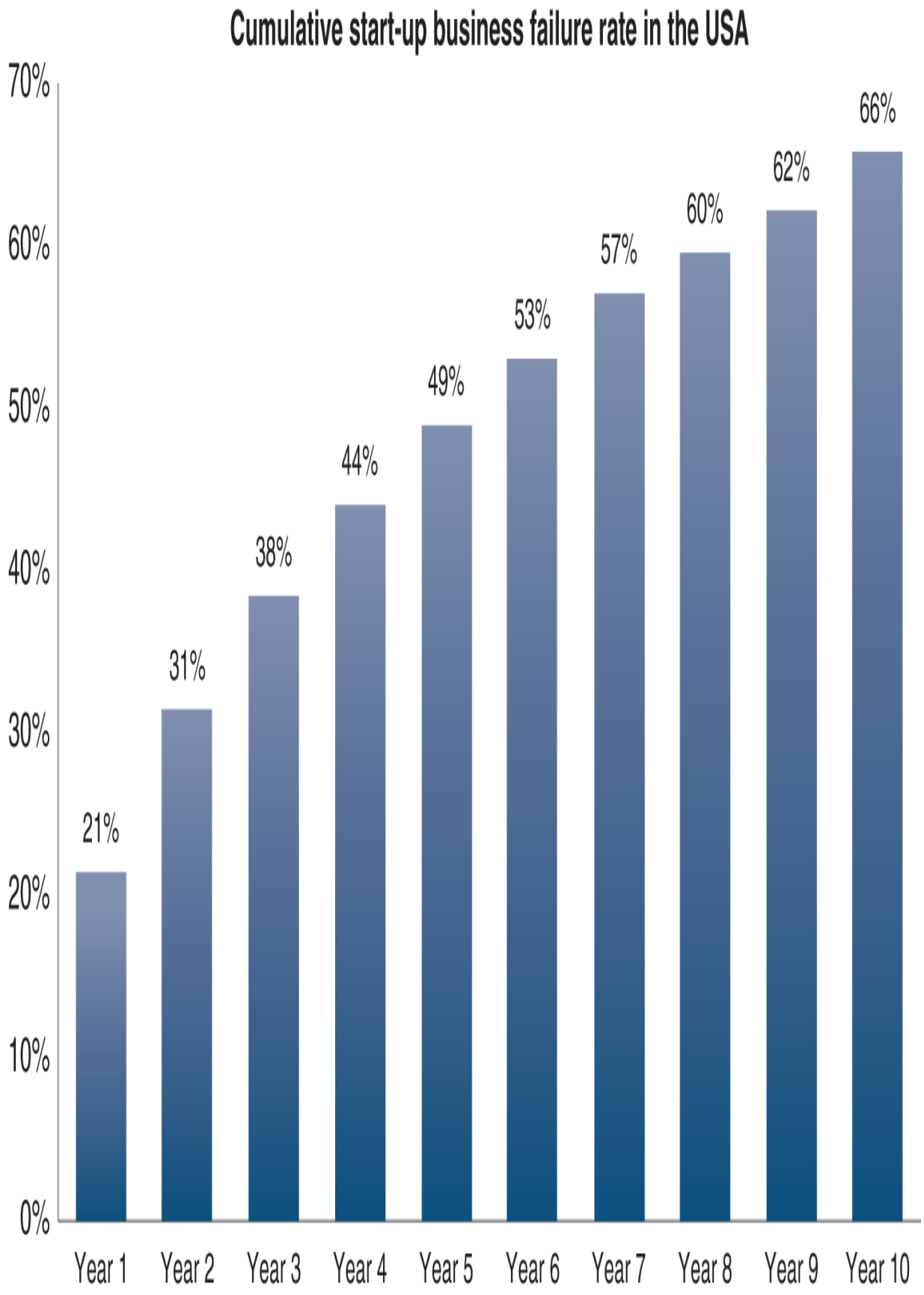
In our view, there are five:

1/ THE EXTREME VOLATILITY OF CAPITAL EMPLOYED, WHICH MEANS VERY HIGH RISK

Many entrepreneurs[1] who launch businesses have an idea or a product or a service but do not yet have an economic model that would enable them to cover their costs and get a reasonable return on their capital invested. When Larry Page and Sergey Brin developed their algorithms that were to give rise to Google, their aim was to come up with a more efficient search engine than those already in existence. They were not sure that they would succeed and they had no idea of how they could make this tool pay. It was only some years later that the idea of associating advertising with searches was born, resulting in a particularly efficient economic model.

This fundamental uncertainty about the relevance of a concept and the ability to find a money-earning demand for it is not specific to the Internet sector. The same situation can be found in the fields of biotechnology, industrial innovation and new services, as well as in commerce.

This is the reason why only 34% of companies created in the US survive 10 years after their inception.


Cumulative start-up business failure rate in the USA
70%
60%
50%
40%
30%
20%
10%
0%
21%
31%
38%
44%
49%
53%
57%
60%
62%
66%
Year 1
Year 2
Year 3
Year 4
Year 5
Year 6
Year 7
Year 8
Year 9
Year 10

Source: Business Employment Dynamics Report, Bureau of Labor, 2021

> Setting up a company is the riskiest segment of the economy, but also the most necessary for ensuring the renewal of economic life.

Far from being linear, the development of a start-up[2] goes through successive stages, which are all possible occasions for failure and/or a change in direction. An entrepreneur has an idea. Will they be able to raise the funds necessary for creating the prototype? If so, will it be possible to create functions that will give the product a competitive advantage? If so, will the entrepreneur find customers prepared to acquire the product at a price that more than covers costs? If so, will it be possible to shift to a mass-production phase without losing the quality of the prototype? If so, etc.

A "no" does not necessarily mean the end of the story, but perhaps a departure in a new direction after specific corrections have been made, or possibly having to go back to the drawing board. So new entrepreneurs have to be psychologically strong and have solid finances!

2/ THE CRUCIAL ROLE OF THE FOUNDER

An enterprise is often set up by one person (Marcel Dassault, Elon Musk, Richard Branson) or a small group of individuals who personally bear a very high level of risk, giving up a situation in which they are well established or renouncing the possibility of such a situation, for what for many of them will in the end turn out to be nothing more than a pipe dream. But they bring a project, a vision and a charisma that is indispensable for facing the unknown, adversity and challenges, and indispensable for convincing others (employees, investors) to follow them. Without the founder, the company would simply not exist.

From a financial point of view, a person starting up a company is the polar opposite of the ideal investor described by the CAPM in Chapter 19. The entrepreneur focuses on a single asset and takes all of the risks. The concept of diversification means nothing to them – it is all or nothing. They have a tiny chance of taking home the big prize and a huge risk of losing everything. But the entrepreneur does not reason in terms of probability like

the financial manager does. Their aim is not financial (personal enrichment), but rather, and above all, humanistic (to create). They live in a completely different world.

The entrepreneur generally feels very passionate about their company – it is their creation – which is a far cry from the cold detachment of the financial manager for whom everything is just a question of risk and return. As we will see, this character trait of the entrepreneur is not without danger when their desire to control pushes them to take on too much debt or to put the brakes on the company's growth.

3/ THE NEED FOR EXTERNAL FINANCING

Very few start-ups immediately generate positive cash flow. Most often, they initially make losses and some have to wait several years before they are able to record their first euro of sales. And when they do start recording positive earnings, investments (in fixed assets and working capital) are rarely fully covered by cash flows.

Since their free cash flow is negative, it is imperative that they find external financing, as generally the entrepreneur does not have sufficient assets to finance their adventure on their own.

4/ A MORE ACTIVE ROLE FOR INVESTORS

Investors hope that they have invested in the next unicorn (valuation greater than $1bn), centaur (valuation greater than $100m), or at the very least pony (valuation greater than $10m), while remaining aware that out of 10 investments that they make, seven to eight will yield nothing, one or two will earn a reasonable return and the tenth could earn 10 or 100 times the investment, saving all of the rest.

According to Cambridge Associates, the post-fee IRR of US venture capital funds is between 10 to 15% per year. Funds created in 2009 yield 20% in the upper quartile and only 5% in the lower quartile. The standard deviation is 12%.

Given that they are taking very high risks, they will monitor their investments very closely, providing the entrepreneur with advice and contacts to help steer the company in the right direction. The entrepreneur is

very much in favour of a high level of involvement by investors as they bring what the entrepreneur lacks – experience, contacts, distance, advice on taking difficult decisions and … capital. The loneliness of the entrepreneur is not a myth.

Since the company will raise funds several times before it succeeds in generating positive cash flows, investors have every interest in ensuring that the company follows its road map so as to be able to form an opinion before it takes any decision to reinvest. Their close involvement alongside the manager is thus not disinterested. It is made a lot easier by the fact that, generally, there are not very many of them.

5/ A HIGHLY SPECULATIVE VALUATION WHICH IS THUS VOLATILE

Unsurprisingly, the extreme volatility of capital employed can be seen in the share price, even without the leverage effect, with very sharp share price variations. These variations are the sign of high risk that is specific to this stage of the company's development. This is illustrated by the share price performances of Innate Pharma, a biotechnology start-up, and Sanofi, one of the world leaders in the pharmaceutical sector.

Share price of Innate Pharma (in euros) and Sanofi (rebased on Innate Pharma) since April 2010
(€)
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
-
Innate Pharma
Sanofi
(rebased)
Apr-10
Apr-11
Apr-12
Apr-13
Apr-14
Apr-15
Apr-16
Apr-17
Apr-18
Apr-19
Apr-20
Apr-21

Innate Pharma was created in 1999 and has since then raised around €305m through ten capital increases. In June 2021, its market capitalisation stood at €234m, compared with €107bn for Sanofi.

Source: Euronext

The sudden changes in Innate Pharma's share price indicate disappointing results or breakthroughs in its medical research programme.

Section 40.2 SOME BASIC PRINCIPLES FOR FINANCING A START-UP

1/ EQUITY CAPITAL, MORE EQUITY CAPITAL AND EVEN MORE EQUITY CAPITAL

When the economic model of the company is not clearly established and its exploitation does not require assets to be held which have a value that is independent of the activity (real estate, commercial lease), the only reasonable way for a company to finance itself is with equity capital.

Debt, because of the regular payment of interest and the repayment of capital, is quite unsuitable when cash flow is unpredictable and negative over an undetermined period. Entrepreneurs need time to test their products or services, correct errors, make adaptations in line with feedback from the first customers, drop 80% of what's been done if necessary and head off in another direction. Entrepreneurs are completely wrapped up in their adventures and cannot allow themselves to be distracted or have their timeframes dictated by debt, ticking away like a time bomb.

We have seen too many talented entrepreneurs seeking to avoid being diluted in the capital of their companies by issuing too much debt too early. At this stage of the company's development, the challenge is not to avoid dilution or to minimise it, but to demonstrate that the company is viable. Better to have a small stake in a company that has had the time it needs to prove that it is viable, than a large stake in a company that is heading for bankruptcy or whose liabilities have to be restructured, as in this case the entrepreneur dilution will be massive.

We cannot stress this point enough.

> Risk should be financed using equity capital and nothing else.

Once the economic model has been found and its viability has been more or less assured, the company can then take out debt.

It is only if the start-up uses assets whose value is independent of its activity – such as vehicles or equipment with a secondary market – that it

can finance them partially using debt. This is the case in sectors like retail, transport and restaurants where business models are proven. The initial investment is often higher than in the Internet or personal services sectors. Debt then makes it possible to get sufficient financing together, which would be difficult using only equity. If this is the case, it should be as long-term as possible, ideally through a leasing agreement so as to avoid putting pressure on the entrepreneur.

This can also be the case for a company that needs to finance a large working capital for its growth. Thus, the use of factoring or discounting of receivables can enable a start-up to finance its growth.

2/ ONE OR SEVERAL ROUNDS OF FINANCING?

Between 1999 and 2020, Innate Pharma, the biotechnology start-up mentioned above, raised €305m in equity from venture capital funds or the public (it has been listed since 2006) in ten capital increases. One every two years. Wouldn't it have been simpler to carry out a single capital increase of €305m in 1999, thus giving the company peace of mind with regard to its financing?

No. This would not have been in the interests of either the investors or the entrepreneur.

The former because they are reluctant to give the entrepreneur a blank cheque and will only give the financial resources necessary for getting to the next step of the entrepreneurial adventure: development of a prototype, opening and operation for a few months of the first store, reaching 100,000 members for a social network, etc. If the step is successfully reached, a new round of financing will be organised with the same investors and/or new ones, giving the company the financial resources necessary for reaching the next step. Here again, investors will most often only consider committing to a new round of financing if this new step is reached.

If the next step is not reached, investors will step in and decide whether any corrective measures introduced by the entrepreneur look like they are sufficiently solid to warrant continuing the adventure in this new direction and participating in a new (last?) round of financing. If not, the adventure will probably stop there.

This system using several rounds of financing enables investors to control the entrepreneur, to resolve potential conflicts of interest and to allocate their funds to the most promising projects. The interest for entrepreneurs, after an initial failure, is to persevere, come what may, as long as the funds that are being used are not being provided by them. The fear for investors would be that entrepreneurs get themselves into more and more difficulties, wasting funds that could be better used on other projects run by other teams. Here we can see the mechanisms of agency theory, discussed in Chapter 26.

For the entrepreneur, massive fundraising for forecasted financing requirements over several years of activities is not a panacea either. As the company has not yet proved anything – or very little – the issue price of shares is likely to be very low and the entrepreneur will be significantly diluted. On the other hand, in a succession of financing rounds, since each one marks the success of a step, the entrepreneur and the investors in the previous rounds will be in a good position to negotiate a higher share price at each round, thus limiting the dilution of the shareholders and also the entrepreneur.

> Entrepreneurs and investors thus have a joint interest in organising successive rounds of financing, each of which are a real option on the next step of development of the start-up.

3/ GOODWILL AT THE START OR AT THE EXIT?

Goodwill is the difference between the value of equity and the amount of equity invested. Its conceptual basis is the ability of the firm to generate, over a certain period, returns that are higher than those required by investors, given the risk (see Chapter 31).

The entrepreneur often considers that they are contributing the idea, the ability to implement the idea, and funds (although not a lot). Investors, for their part, only contribute funds. Accordingly, it will only seem logical to the entrepreneur to receive better treatment than the investors when shares and voting rights are being allocated, enabling them to retain a majority of voting rights in the project. This is why often, during the first round of financing, there is a higher issue price for shares for investors than for the

founders. The difference is often considerable, especially if there is a lot of buzz around this new company. We've seen investors pay 100 times more for their shares than the entrepreneurs, which is a lot for a company that has yet to prove itself!

This practice is not without danger. As soon as the emerging company, after a few quarters of activity, is unable to stick to its roadmap and fails to meet its first targets, the question of a second round of financing is raised very quickly, while the funds raised in the first round are in the process of being totally depleted.

The relationship between the entrepreneur and the investors could deteriorate rapidly. The investors have made a capital loss because of the entrepreneur who has not delivered what was promised in the business plan, while the entrepreneur has made a capital gain thanks to the goodwill paid by the investors, who discover that there was no real foundation for this goodwill. Although all of the shareholders will have to get together to study how to get things back on track, and to correct or call into question all or part of the strategy implemented until now, there is the risk that any such meeting will be marred by a poisonous atmosphere. This can result in a deadlock at a time when it is vital that things keep moving.

The initial investors, unhappy with the situation, will then find it very difficult to agree to participate in a second round of financing, even though the subscription of new shares will enable them to lower the average cost price of their shares. They often prefer to accept their losses and dilution and move on to other opportunities, rather than go back to their investment committees to explain that they were wrong the previous time about the relevance of the concept and the price paid, but that this time, they're right, even though the entrepreneur has just acknowledged a first failure. We are now no longer in the realm of pure rationality but have moved into the realm of behavioural finance! (See Section 15.6.)

Since our entrepreneur probably doesn't have the resources to finance the new direction of the company, new investors will have to be found. The task of convincing them will be particularly arduous, as the signal sent by the failure of the initial investors to participate in this new round of financing is extremely negative. There is a high probability of this search for financing ending in failure. If the search for funds is fruitful, the shares

in the second round of financing will be issued at a lower price than the initial round and the entrepreneur will then be massively diluted.

This is the lesser of two evils, because if the search for new investors yields no results, the entrepreneur will be forced to sell the company in very bad conditions, or to liquidate it, which is what happens most frequently.

We could consider, in order to avoid such situations, not asking investors to pay goodwill at the start during the first rounds of financing, but getting them to pay it when they exit, on the basis of the results achieved. Concretely, the shares would be issued when the company is set up, at the same price for all shareholders. Entrepreneurs will get investors to give them call options on a part of their new shareholding at a symbolic exercise price, or stock options, or warrants which will enhance the value of their shares in the future.

But there will be conditions to this enhancement – a given level of investor returns (IRR achieved in the event of sale or a new round of financing). Goodwill will then be paid by investors in the form of dilution of their rate of return, only if it is effectively delivered.

In the very likely event of something going wrong along the way, the situation can be looked at coolly and calmly by the initial shareholders who, since they have all paid the same price for their shares, will have the same interests at heart.

However, we won't hide the fact that this will be difficult to accept for a passionate entrepreneur, who sees himself as a new Louis Vuitton or Jack Ma (Alibaba) and who hasn't necessarily given the subject much thought.

More fundamentally, it raises the issue of the motivation and the incentive of the entrepreneur whose role in “their” company risks being symbolic, while the accretive instruments are not exercised, which will only happen in a few years. The risk is that they may consider themselves more as an employee than as an entrepreneur, and that would mean certain death for the emerging company! An entrepreneur should never behave like an employee. They should always be thinking about their project, night and day, like a soul possessed! Yes, we're still in the realm of behavioural finance!

Goodwill at the start is probably the price to be paid by investors so that entrepreneurs feels they are the boss of their own house and so that they give their project all they've got. But this is not without adding a financial risk, as we have seen, to the intrinsic risk of a start-up. The best entrepreneurs are likely to do better, but the vast majority will not perform as well.

The whole question can be summed up as follows: “Goodwill, yes, but not too much”, so as to retain potential for enhancement of the share, capital increase after capital increase, and to avoid deadlocks or the implementation of ratchet clauses with disastrous effects for the entrepreneur. In the end, an overly optimistic business plan is not in the interests of entrepreneurs, who could find themselves sitting on a hand grenade from which they themselves have pulled the pin!

It should be noted that the creation of shares with multiple voting rights for founders makes it possible to raise large sums of money by circumventing this problem of dilution of power, whilst distinguishing it from goodwill.

Section 40.3 INVESTORS IN START-UPS

1/ INVESTORS IN EQUITY CAPITAL

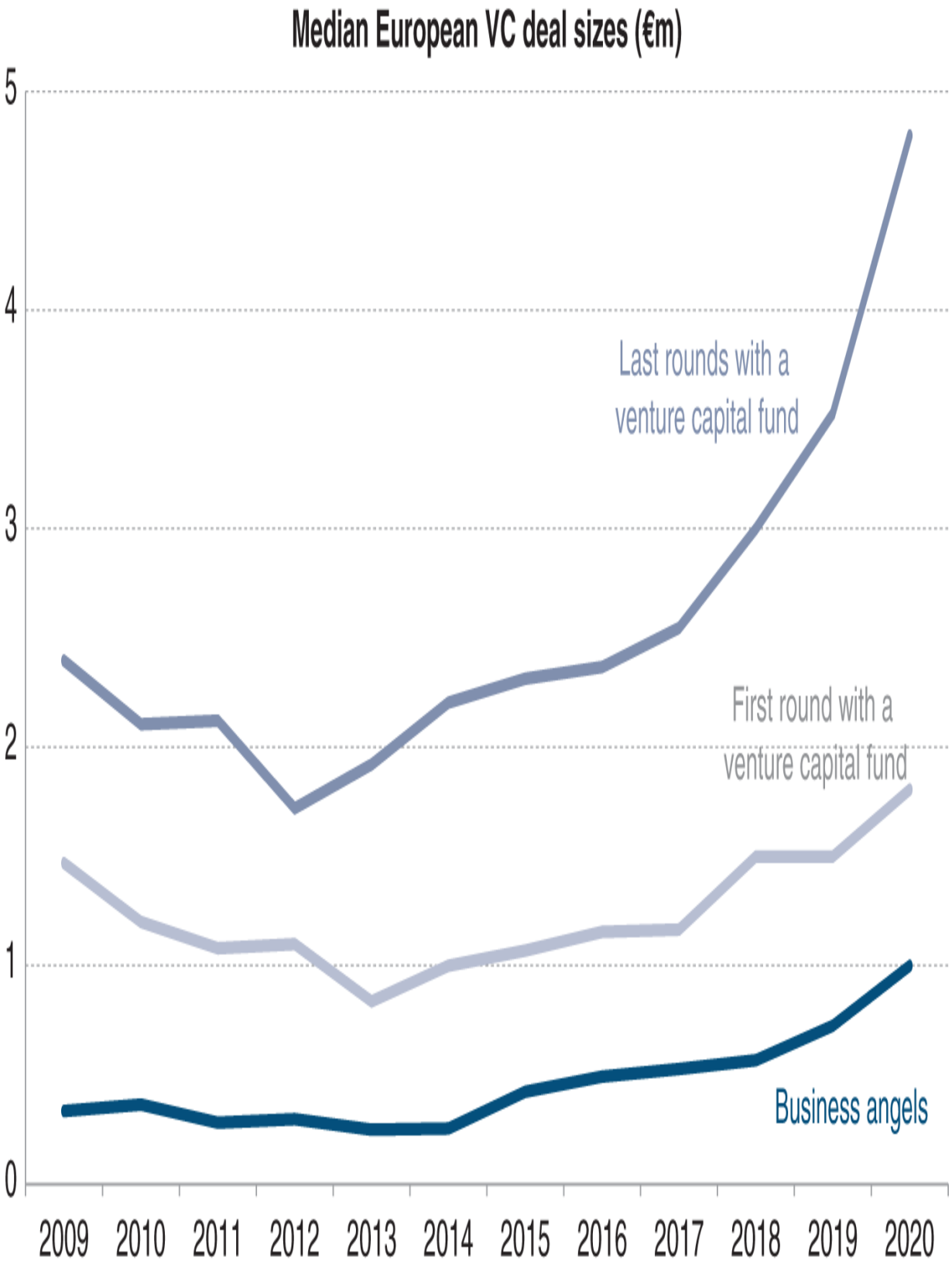
The first among them is the entrepreneur, with their life savings, sometimes topped up by a bank loan that is secured by their home. They can spend the first months of the adventure with an incubator which will provide them with premises and services remunerated by a few percentage points of capital. The idea then becomes a project.

Friends and family are often among the initial investors, probably less motivated by the idea of making money, but more by loyalty! This type of investment is referred to as **love money**, which usually raises a few tens of thousands of euros.

Crowdfunding can be used by the entrepreneur to raise funds through specialised Internet platforms from a very large number of private investors, the most motivated of whom will invest a few hundred or a few thousand euros each. This will enable the entrepreneur to test the concept on a large scale. However, they will be lucky to raise a few hundred thousand euros in this way and struggle to raise more.

Business angels are often former company managers and shareholders. They invest a few tens or hundreds of thousands of euros per project, often called “seed money”. They also provide advice to the entrepreneur and give them access to their networks.

Venture capital funds can provide the entrepreneur with larger amounts of financing, from €0.5m to several tens of millions of euros (sometimes hundreds of millions), if the project has very high development potential.



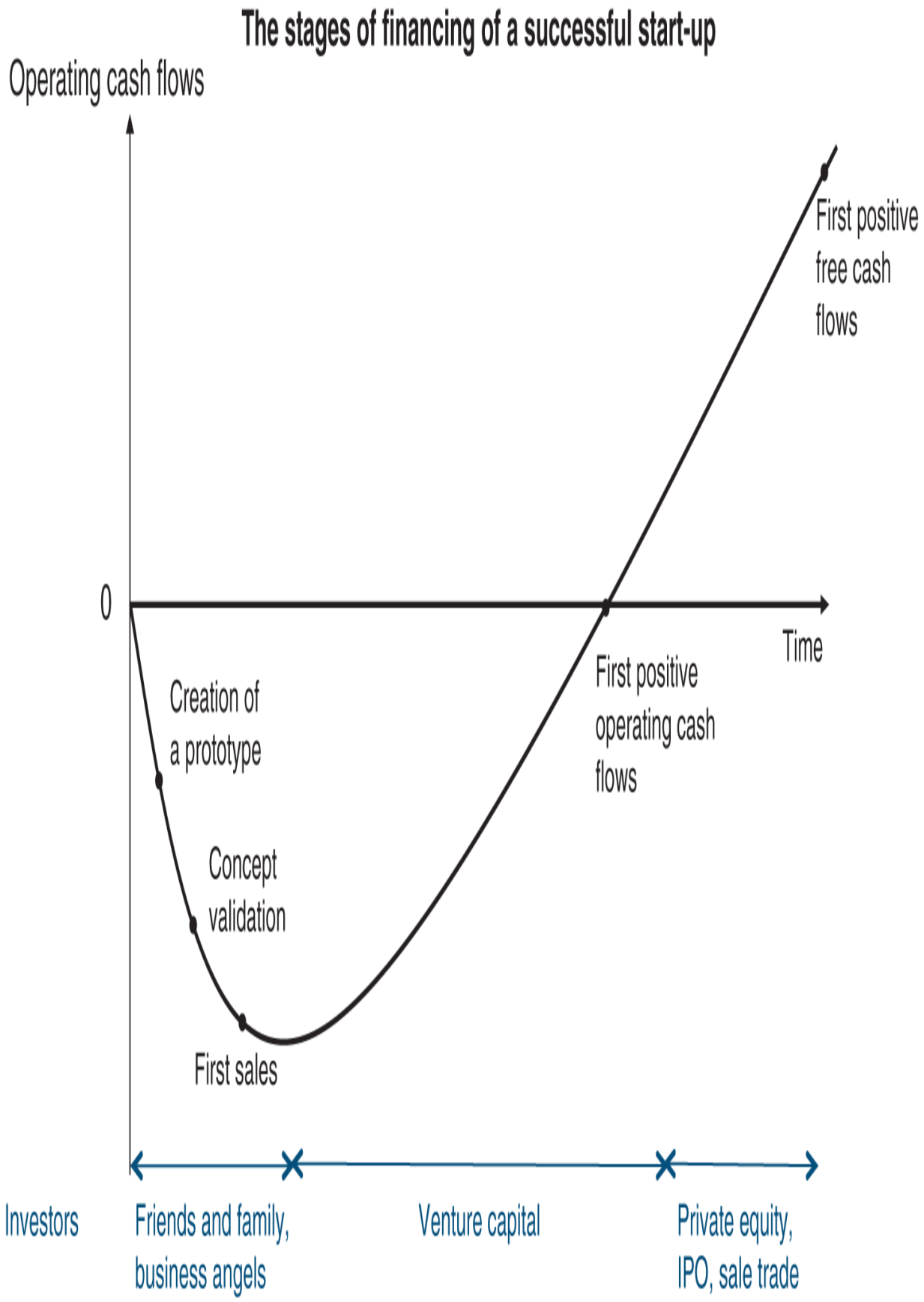
Source: Business Employment Dynamics Report, Bureau of Labor, 2021

Some industrial groups have created internal investment funds (or joint funds for several groups in the same industry sector) with the dual aim of financing innovation and keeping a strategic watch on developments in their sector, such as Novartis, Intel, Pfizer, Orange, GE or Danone. In such cases, we refer to *corporate venture*.

The first round of financing from financial or industrial venture capital funds is called Series A, the second round is called Series B, the third round is called Series C, and so on.

Raising funds on the stock market by listing a company is a real possibility for companies, especially in the high-tech, Internet, biotech and medtech sectors.

Each type of investor plays a role at the different stages of the development of the young company:


The stages of financing of a successful start-up
Operating cash flows
First positive free cash flows
0
Time
First positive operating cash flows
Creation of a prototype
Concept validation
First sales
Investors
Friends and family, business angels
Venture capital
Private equity, IPO, sale trade

Most often investors subscribe to shares, sometimes preferred shares, given the different rights that may be granted to them, as we shall see. While waiting for a financing round that is overdue, they may be led to subscribe to a bridge financing, often taking the form of bonds redeemable in shares based on a price that will be that of the next expected financing round, minus a more or less significant discount (15 to 30%) to encourage subscription when the value of the company is unclear. Paradoxically, these bonds are often called convertible bonds, which is an abuse of language since they cannot be redeemed in cash. Alternatively, warrants are sometimes issued for the same amount, giving the right to subscribe to the nominal amount of a variable number of shares at a discount when the financing round is completed.

2/ INVESTORS IN DEBT

There are practically no investors in debt prepared to finance start-ups and, as we saw in Section 40.2, it is not in the interest of the entrepreneur to take out debt until they have demonstrated the validity of their business model.

It is only if the start-up uses or generates assets that have a value that is independent of its operations (vehicles, real estate, business) that it can make use of leasing (see Chapter 21). If it generates sales, it can finance its working capital using discounting or factoring (Chapter 21). Companies with significant R&D expenses may factor their research tax credits. An unallocated bank loan (i.e. financing the company in general rather than specific assets) will only be found if the entrepreneur provides guarantees with a value that is independent of the project. In some countries, state bodies can guarantee loans granted by commercial banks to start-ups.

3/ OTHER SOURCES OF FINANCING

These are more marginal and are often a form of supplementary financing, like subsidies, repayable advances in the event of success, honour loans granted by associations or foundations, competitions for start-ups organised by local authorities or foundations, grants by local authorities, research tax credits, etc.

Section 40.4 THE ORGANISATION OF RELATIONSHIPS BETWEEN THE ENTREPRENEUR AND THE FINANCIAL INVESTORS

The relationship over time between the investors and the entrepreneur(s) is set out in the **shareholders' agreement** signed at the time when the funds are handed over. See Chapter 41 for standard clauses of a shareholders' agreement which are not used in the case of a start-up.

> The larger the difference between the amount paid by the investors and that paid by the founders for their shares (large amount of goodwill), the more elaborate the shareholders' agreement of the start-up will be.

A shareholders' agreement is the result of a negotiation and sets out the balance between demand for and supply of venture capital at the time that it is signed. It also reflects the power of attraction of a given start-up project or of a given entrepreneur.

1/ CLAUSES BINDING THE FOUNDER-MANAGERS

Any investor in a start-up will tell you that the main motivation behind the investment is the quality of the founding team. Accordingly, it is not surprising that investors set, as a condition for investing, the condition that the managers commit themselves fully and over the long term to this adventure. We also find clauses preventing the founders from holding other positions in other companies or from selling their shares during a certain period (lock-up); clauses that make provision for the loss of their shares and other incentives if they leave the company before a certain period (vesting), along with agreements not to compete; and clauses that give the company the intellectual property rights created by the founders.

Over and above the shareholders' agreement, we also see mechanisms that create incentives for the founding managers, in such a way that even if they are heavily diluted by several capital increases, they remain highly motivated – stock options, call options, warrants, multiple voting rights, etc.

2/ CLAUSES THAT ARE THE CONSEQUENCE OF GOODWILL BEING PAID AT THE START

If goodwill was paid at the start, the investors will want to prevent the founders from selling the young company too soon, on the basis of a valuation that enables them to recover only a part of their investment while the founders could make a comfortable capital gain (see Exercise 2 for an illustration). In order to avoid this situation, provision can be made that the income from the sale of the company goes first to the investors, in the amount of their investment (sometimes capitalised using a minimum rate of return), and is then shared out between investors and founders whose interests are then aligned.

This provision, known as the preferential liquidity clause, is also used in the event of a resale or liquidation several years after the first round, to protect the most recent investors who have normally paid the highest price. A sale of the company at a price lower than the last round of financing might be convenient for the previous shareholders, including the founders, who have lower cost prices, but would put the most recent investors at a loss. To avoid this situation, and because they agree to pay a higher price thereby reducing the dilution of the current shareholders, the most recent investors will often ask for a preferential liquidity clause. However, in order to allow founders and investors from previous rounds of financing to be able to retrieve their funds even in the event of a low resale price, a partial equal distribution is most often included at the beginning along the following lines:

20% of the price is usually shared pro rata among all shareholders, including the founders (“carve out”).

The remainder of the sale's proceeds are allocated first to investors from the most recent fundraising round, until repayment of their investment, with returns possibly capitalised, and after deducting any amounts received in the first allocation.

Finally, the remainder (if any) is distributed to all the other shareholders (including the founders) in due proportion to their holdings.

This clause only comes into play if the sale (or liquidation) price is insufficient to allow the investors of the last round to recover their

investment (sometimes with capitalisation), via a normal distribution of the proceeds of the sale in proportion to their holdings.

The preferential liquidity clause is undoubtedly a protection for investors against valuation inflation, at least until the next round of financing. It is also undoubtedly a factor in the valuation inflation of successful start-ups, as investors are less concerned about the level of valuation since they are protected from overvaluation. Current shareholders and founders accept it because it allows for higher, more flattering and less dilutive valuations, and because they hope that the company's development will lead to a further increase in its value and that this clause will therefore not come into play.

The preferential liquidity clause tends to eliminate the ratchet clause, whose implementation dilutes management too massively. This clause allows investors in the first rounds to receive free shares in subsequent rounds of financing carried out at prices lower than their entry price (an illustration of this is provided in Exercise 4).

3/ CLAUSES RELATED TO THE LIQUIDITY OF THE INVESTMENT

There are different clauses that seek to ensure that investors are able to sell their stakes in such a way as to reap the benefits of their investment. This is, moreover, one of the stated aims of an investment fund, which itself is often required, at the latest when it is wound up, to distribute the income from its investments.

Accordingly, investors can get the founders to agree to the sale of all of their shares in the company after a certain period, if the majority shareholders have not provided them with sufficient liquidity for their investment. A sale of the majority of the shares will enable them to get a better price than if they had only offered a (generally) minority stake for sale (see Section 31.6). Having said that, implementing this clause is very difficult because if the entrepreneur doesn't want to sell despite having pledged to, they will not be very convincing when trying to get a buyer to make an offer.

Very often, the investors want to be able to sell all or part of their shares before the founders sell theirs, in the case of an IPO or a planned sale by the founders. If they are not given this priority, they may ask for the option to

sell the same percentage of their stakes as the founders in the event of a sale (tag-along clause) or if there is a change in control over the company. A drag-along clause is nearly always introduced to provide a group of majority shareholders representing a given percentage of the capital with the option of forcing the other shareholders to sell their shares on the same terms as those offered to them by a buyer. Such a buyer may condition its offer on obtaining all of the capital and in this case, the majority shareholders will not want to have to cope with being blackmailed by a minority shareholder.

4/ CLAUSES RELATED TO CONTROL BY INVESTORS OVER COMPANY DECISIONS

Demonstrating that they are keen to be more closely associated with the running of the young company and the risks that they are prepared to take, investors often require a level of information that is accurate, wide, frequent and adapted to the situation and the activity of the company.

Additionally, provision can be made that certain important decisions (such as modification of the articles of association (by-laws), hiring of key staff, modification of the company's strategy, investments, acquisitions or disposals, etc.) can only be taken by a qualified majority, giving investors a de facto veto right.

Section 40.5 THE FINANCIAL MANAGEMENT OF A START-UP

There are two principles that underlie the financial management of a start-up: keep a very close watch on the cash position and plan the next round of fundraising very well.

Cash on the assets side of the balance sheet, when there is no monthly cash income, measures the number of months of survival of the company before it is obliged to carry out another round of fundraising. This is called the burn rate. How much time does the company have to reach its next step or to shift from plan A, which has failed, to plan B, which has to be invented and implemented?

Unless the existing shareholders have the financial resources necessary to cover the financing of the next round and agree to do so, the manager of the start-up would be well advised to launch the process of looking for new investors six to nine months at the latest before their cash runs out. Since a round of financing most often covers requirements for the next 12 to 24 months, it comes around quickly. The search for new investors and the conviction needed are very time-consuming, especially for a manager who doesn't have a financial director to help them.

Launching a new round of financing early is often too early: the company has not yet shown that it has reached a new step in its development since the last round of fundraising. Waiting until later means taking the risk of running out of cash during the final phase of negotiations with investors, at the risk of having to admit defeat.

> The head of the company must also be an excellent tactician!

Section 40.6 THE PARTICULARITIES OF VALUING YOUNG COMPANIES

It is obviously very difficult to value a company that has not yet proved the relevance of its business model, which has a high probability of disappearing in the short term, and for which projections are so uncertain that sometimes one might ask whether they're worth the paper they're printed on.

One might thus think that the real option method seen in Chapter 30 is particularly well suited to valuing the young company because the way it works in stages is very similar to the successive stages of development that the young company must go through. In practice, this is not the case at all and it is practically never used in this field. Drawing up a business plan that makes sense and that is also optimistic is complicated, but asking an entrepreneur to draft different versions, including one which leads to bankruptcy, is counter-productive. Do we really want to demoralise and discourage the entrepreneur at a time when they need to be boosted in order to meet the challenges they are facing? Of course not!

Valuation by discounting free cash flows (see Chapter 31) is not very widespread, even though the basic raw material for this method, the business plan, is often available. In order to avoid using this method, investors raise the pretext of the extreme volatility of business plans for start-ups, given that there is very little chance of new companies sticking to them and the fact that they reflect the best of possible outcomes, rather than the most likely. Conceptually, though, there is nothing that prevents this method from being used by looking at the probabilities of several projections.

As for the multiples method (see Chapter 31), given that its use is conditional on the existence of comparable listed companies, it is de facto unusable for valuing very young companies, which are all different from each other and very rarely listed on the stock exchange. Additionally, the fact that most of them have negative earnings would render the operation impossible.

Our reader may be surprised by the very crude nature of the valuation of start-ups, which is more a matter of convention than of calculation. At least

for its first rounds of financing, the value of a start-up usually results from a multiple of the amount of funds sought to reach the next level in 12 to 24 months, and/or what amounts to the same thing, the percentage of dilution that the founders agree to.

Practice has shown that a pre-money valuation (i.e. before the capital increase) of 1 to 1.5 times the amount sought is the sign of an unfavourable period for entrepreneurs corresponding to a relative scarcity of capital ready to invest at this stage of company development. In order to finance the next 12 to 24 months, entrepreneurs must be satisfied with 50% to 60% of the company's capital. They will therefore very quickly lose control, as it is unlikely that there will be just one fund raising. Beyond four times, and the opposite happens and we're probably in a bubble period. The entrepreneur then succeeds in selling only 20% at most of the share capital during this round of financing.

In normal times we are between 2 and 3, and the founders are diluted from 25% to 33% of the capital.

	Funds raised (m€)					
Pre-money value (m€)	**0.5**	**1**	**1.5**	**2**	**2.5**	**3**
1	2					
	33%					
1.5	3	1.5				
	25%	40%				
2	4	2	1.3			
	20%	33%	43%			
2.5	5	2.5	1.7	1.3		
	17%	29%	38%	44%		
3		3	2	1.5	1.2	
		25%	33%	40%	45%	
4		4	2.7	2.0	1.6	1.3
		20%	27%	33%	38%	43%
5		5	3.3	2.5	2	1.7

	Funds raised (m€)					
Pre-money value (m€)	**0.5**	**1**	**1.5**	**2**	**2.5**	**3**
		17%	23%	29%	33%	38%
7.5			5.0	3.8	3.0	2.5
			17%	21%	25%	29%
10				5	4	3.3
				17%	20%	23%

The table above shows in each box the multiplier coefficient of the fundraising round, and the level of dilution suffered by the founders (which also corresponds to the ownership percentage of investors). We have not filled in the boxes that seem to us to be outliers, where the founders lose control from the first round of investment, or where the valuation bubble stretches to the moon!

> Thus, for the entrepreneur, the issue is more about demonstrating the appropriateness of the amount to be raised than the value that derives from it. It's a bit of an upside-down world, which is why some people say that “it's the tail wagging the dog”.

We remind our horrified reader that the risk to the investor at this very early stage is not overvaluation, but bankruptcy.

For start-ups that have survived and progressed to an advanced stage of development, venture capital professionals have developed a method that is rather pragmatic and efficient, if a bit simplistic, which they use for valuing young companies, known as the venture capital method. As you will see, it is a hybrid of the multiples and discounted free cash flow methods.

We start by estimating the probable value of the company's equity in four to seven years, when it will have reached a level of maturity to allow it either to be listed or to be sold to a third party, most frequently an industrial player. This timeframe corresponds to the exit of the venture capitalist and to the fact that the company is no longer a start-up (hopefully) but a developing company. This future value is calculated by applying the P/E ratio today, observed for companies in this stage of development, to net

earnings forecast in the business plan at this period (for more on the P/E ratio, see Chapter 22); for example, 15 times net earnings of €8m, i.e. €120m.

Secondly, and in order to determine the present value, this future value of equity is discounted to a value today, using a high discount rate since the company is at an early stage of its development.[3] The rates most frequently observed are as follows:

Phase	Discount rate	Equivalent to multiply the investment by	Over … years
Start-up (Seed)	60%	11.2	7
First round	50%	7.6	5
Second round	40%	3.8	4
Third round	30%	2.2	3
Before IPO	20%	1.4	2

So, for a pure start-up, with a business plan period of seven years, the value today of the equity is €120m / $(1 + 60\%)^7$ = €4.5m. This result is post-money as it assumes that the company has found the financing necessary for developing its activities. If today it needs €1.5m, the value of its equity is €4.5 – €1.5 = €3m. The investor who contributes these funds gets 33% (1.5 / 4.5) of the company's equity. If the company's capital is made up of a million shares, the investor will have to be issued with 500,000 new shares at a unit price of €3.

The reader will not be surprised at how high these rates are and will have difficulty reconciling them with those provided by the CAPM in Chapter 19 or with the average IRR obtained by venture capital funds (between 15% and 30%), and rightly so, as they are of another order.

If they appear to be high, it is because they integrate the risk of the start-up going bankrupt. They are applied to a level of earnings that does not correspond to the average of different scenarios, but to a business plan that reflects, by construction, the success of the company. However, over a five-year period, at least 40% of companies will have disappeared and out of

those that are left, a large number will not have lived up to expectations. Accordingly, the high discount rate takes into consideration the risk that the projections will turn out to have been too optimistic, which is most often the case.

The rate of return required by the investor also takes into account the illiquidity of the investment (see Section 19.4) and also remunerates the non-financial contributions by the investor (operational or managerial advice, network access, etc.).

Our rather simplistic model assumes that a single round of fundraising was necessary before reaching a stage where the company could be sold or listed. Let's assume that there is a second round of fundraising of €5m in year three. At the time of this fundraising, the post-money valuation of the company made by the second investor, who would require a rate of return of 40%, would be: €120m / (1 + 40%) = €31.2m, which results in a percentage for this second investor of 5 / 31.2 = 16%.

The terminal value remains €120m since it assumes, if it is to be achieved, a second round of fundraising. Our first investor will be diluted by this second capital increase. Accordingly, they thus need to hold a larger part of the capital after their contribution of funds, to set off the dilutive effect of the second capital increase and to obtain their rate of return of 60%. This stake is calculated as follows: 33% / (1 – 16%) = 39.3%. Instead of 500,000 new shares issued in the first round of financing, which would give 33% of the share capital to our first investor, 647,000 new shares[4] should be issued. Since the latter is still bringing €1.5m to the table, this means that the shares are issued at a unit price of €1.5m / 0.647m = €2.32, and no longer €3, when there is no subsequent dilution.

If, in seven years' time, the value of the company's equity capital is indeed €120m, our first investor, who took a 39.3% stake in the capital when the company was started up, which was then diluted three years later to 33%, can sell their stake for €40m. For an investment of €1.5m made seven years earlier, they have, in fact, obtained their rate of return of 60% per year. As for the second investor who invested €5m in the third year and who got 16% of the capital, the sale of these shares in year seven for 16% × €120m = €19.2m gives them their required rate of return of 40% per year.

All of these correct arithmetical calculations assume, for these rates of return to be achieved, that reality will correspond to the projections. Now that's another story! The reader should be well aware of this.

The venture capital method is also used backwards. A purchase price of shares is offered to you and you want to find the implicit rate of return of this investment if the business plan is met and given your estimation of the final value of the company. You then compare it with the minimum rate of return that you estimate is justified, given the risk of the investment, in order to take your investment decision. Here we find the IRR of Chapter 17.

Section 40.7 EXAMPLE INSPIRED BY A REAL CASE: EXAMPLE.COM

The simplified joint stock company Example SAS was set up eight years ago by two friends with the aim of developing a new-generation social network around the website Example.com, which offers a very powerful yet simple tool based on complex algorithms that had required years of development.

The first round of financing brought together friends and business angels, who contributed €0.6m. Dilution of capital was only 17% thanks to a high level of goodwill, since the managers only contributed €0.1m. This situation is explained by the following: in addition to the quality of the entrepreneurs, algorithms had been pre-developed, giving a clear idea of the development potential, a worldwide market was being targeted and ambitions were high, and finally the entrepreneurs had declined to be paid a salary during the first two years.

On the basis of the launch of the alpha version of the site Example.com one year later, which demonstrated that the algorithms were correct, Example SAS carried out a second capital increase of €1m, which was followed by the original investors, at a share price that was 50% higher. Because Example SAS was keen to speed up its development, which would involve increasing its losses and its working capital, it made the choice to carry out this capital increase relatively quickly, even though its cash position would have enabled it to defer it for a year. Sometimes it is better to stand fast than to run and to avoid financial stress that could have operational consequences. For example, it is easier to recruit a good IT developer when your cash can cover 24 months of cash burn rather than three!

A third capital increase was carried out one year later, which raised €1.9m. Five new investors (mainly business angels) participated in this capital increase alongside some of the original investors. The launch of the beta version of the site and the development of the community, which was growing at 30% per month, played a determining role in the success of this operation.

Example preferred to wait until the last moment to carry out its fourth capital increase, which at €6m was a large one, nearly double the equity

raised previously. When it was finalised, Example SAS only had three months of cash left! The iPad version had just been launched with success and the community had reached 460,000 members, which works out at a monthly growth rate of 18%. The share price could thus be maximised: +40% compared with the capital increase carried out 18 months previously, resulting in dilution of only 30%, but growth in book equity of 1250%. This should be the last capital increase before profits start rolling in.

The funds raised enabled Example to test two revenue models, premium and advertising, which had been partially successful but which failed to lead to equilibrium. Four years later, a final capital increase of €2m was subscribed, at a price per share that was 60% lower than that of the previous capital increase. The challenge for Example will be to break into two new markets that are seen as buoyant markets – the university and the media markets. This is a shift that will require a resizing of the company and a change in profile for a large portion of its workforce. Initial results are promising.

Today, there are 3 million Example users worldwide, with 50% in the USA, 25% in France, and the rest of the world accounting for the last quarter. The two founders, who had brought 1% of the funds raised, hold 35% of the shares and the investors, who brought 99% of the funds, hold 65% of the shares.

SUMMARY

The summary of this chapter can be downloaded from www.vernimmen.com.

The start-up phase is the most risky phase in the economic life of a company, with financial aspects that are strongly influenced by the particularities of this phase: extreme volatility of capital employed as most often the economic model still has to be built, which results in a highly speculative and unstable value; need for external financing because cash flow is rarely positive before several years; crucial role of the founder, who is a virtual demigod, and whose behaviour is the antithesis of that put forward by the CAPM; investors who are more closely involved than they are in an investment in a listed company in order to be able to help the investor by giving advice and connecting them with their networks.

Faced with the very high risk of starting up a company, the virtually exclusive means of financing must be equity capital, because this is the only type of financing that will give the entrepreneur the time needed to validate the concept and find their economic model, which rarely happens on the first try. Most frequently, financing using equity capital is provided in several rounds of financing, on condition that the company passes a new stage of development. This allows the entrepreneur and the investors from the first rounds of financing to hope for dilution with the best price conditions. Goodwill is in general paid at the start by investors. The founders will therefore be less diluted but they will be taking a major risk of deadlock if the business plan is not met, which is the rule rather than the exception when it comes to start-ups.

Depending on the stage of development reached by the young company, its investors will be, other than the founders, their family members, business angels, venture capitalists or industrial players, and in the event of success, the stock exchange. Unless the company uses assets which have a value that is independent of its operating, debt has no place in the financing of start-ups.

Shareholders' agreements of the young company mainly include clauses relating to the founders, to the consequence of any goodwill paid at the start, to the liquidity of the investment and to access to information.

In terms of financial management, the emphasis is placed on the amount of cash on the balance sheet, in order to be able to measure the number of months before a next round of financing, the timing of which is crucial – neither too soon nor too late.

Finally, in terms of valuation, because it is practically impossible to come up with reliable forecasts, the usual valuation methods are not used and a hybrid method made up of the multiples and the discounted cash flows method has been developed for valuing start-ups, or more simply a multiple of funds raised for early stage start-ups.

QUESTIONS

1/How should an internet-of-things start-up be financed? And a pizza chain?

2/What is an optimistic entrepreneur? What are the conclusions to be drawn?

3/What is the counterpart of goodwill paid at the outset for a start-up?

4/What are the advantages of the venture capital method for valuing a company that is in the process of starting up?

5/What are the drawbacks of the venture capital method for valuing a company that is in the process of starting up?

6/Why are discount rates required by investors in start-ups so high?

7/Why are discount rates required by investors in start-ups rarely reached?

8/Why do entrepreneurs accept very high rates of return required by investors?

9/What is a business plan that eventually corresponds to reality?

10/How many months can a company that only has €450,000 in cash left survive if its monthly consumption is €90,000? Is it time to launch the next round of financing?

More questions are waiting for you at www.vernimmen.com.

EXERCISES

1/An investor proposes to contribute €1m to a start-up and to obtain 20% of its capital. What is the pre-money and post-money valuation of this company?

2/A start-up is financed using €1m. The entrepreneur provides €0.2m and obtains 75% of the shares, and business angels provide the rest of the equity and hold 25% of the capital. Eight months later, the entrepreneur is in a position to sell the company for €2m. By how much has their investment multiplied? And the business angels? Redo your calculations, assuming that the shareholders' agreement in this case states that proceeds from the sale must first be allocated to the business angels until repayment of their investment before being shared among all of the shareholders, pro rata to the number of their shares. State your views.

3/Using the data from the previous exercise, what is the amount of goodwill that is generated by the capital increase?

4/A company issues 1,000,000 shares at €1 to the founders, and 800,000 shares at €10 to investors. Eighteen months later, it carries out a second capital increase in favour of an investment fund, which invests €5m, ending up with 36% of the capital. What is the breakdown of capital before and after the second capital increase, according to whether a full ratchet clause applies or not? State your views.

5/A company issues 1,000,000 shares at €1 of which 200,000 are for the founders and 800,000 are for the investors. The investors grant the founders call options with an exercise price of €1 on a third of their stake, if the IRR obtained when they sell their shares is between 25% and 30%, on half of their stake if the IRR is between 30% and 35% and on two-thirds if it is higher than 35%. After five years, the investors have the opportunity to sell their shares for €3.7. What is the IRR before and after the founders exercise their options? And if the sale price were €3.73? State your views. How can this be remedied?

ANSWERS

Questions

1/*Using equity capital given its risk. A bit of medium-term debt is possible as the company has assets with a value that is independent from its operation – equipment, commercial lease.*

2/*A pleonasm. Pessimists do not start up companies. The business plan does not represent the most likely outcome or the average outcome, but the best possible outcome. Accordingly, it is difficult to rely on it when valuing the company.*

3/*A higher level of financial risk for the entrepreneur who will have very little room for error, since they have promised such a lot. Preferential liquidity clauses in the shareholders' agreement.*

4/*It is easy to understand and widely used. Based on the use of very high discount rates, it is well adapted to the congenital optimism of entrepreneurs and avoids discussion on the business plan, which risks leading nowhere.*

5/*It is simple and factors in the optimism of the business plan without criticising.*

6/*Because they are not used to value a company on the basis of an average or likely business plan but solely on the basis of a glowing version, which does not take into account the strong probability of failure. Which is the same as saying that they represent a strong probability of failure.*

7/*Because it is very rare for the business plan used to calculate the value of the company to correspond eventually to reality.*

8/*Because they know that their business plan has very little chance of being realised.*

9/*A miracle!*

10/*Five months. There is not a moment to lose and it might already be too late!*

Exercises

Detailed Excel solutions to the exercises are available at www.vernimmen.com.

1/*€1m = 20% of post-money equity; equity is thus €5m post-transaction. So, pre-money equity amounts to €5m − €1m = €4m.*

2/*The entrepreneur multiplies their investment by 7.5 (75% × 2 / 0.2) and the business angels by 0.6 (25% × 2 / 0.8), so the latter have lost out. After application of the shareholders' agreement, the entrepreneur multiplies their investment by 4.5 (75% × (2 − 0.8) / 0.2) and the business angels by 1.4: (0.8 + 25% × (2 − 0.8)) / 0.8. The gain for the entrepreneur falls from €1.3m to €0.7m, which should dissuade them from selling too quickly.*

3/*€2.2m = 0.8m / 25% − 0.8m − 0.2m.*

4/*Situation at the outset: founders = 56%, investors = 44%.*

Without full ratchet: founders = 37%, investors = 26%, fund = 37%.

With full ratchet: founders = 28%, investors = 44%, fund = 28%.

But since the fund is asking for 36% and not 28% in exchange for its contribution of €5m, the final breakdown is founders = 6%, investors = 58%, fund = 36%. The ratchet clause has resulted in the drastic dilution of the founders, whose motivation will have to be rekindled, one way or another.

5/*29.9%; 22.9%; 30.1%; 18.6%. Although the company's performance is marginally better, the return for the investor is, in the end, not as good (18.6% vs. 22.9%). Rather than making provision for intervals, it is better to have milestones (at 25% of IRR, exercise of 0% of options; at 30% one-third is exercised; at 35% half, etc.) and then make provision for linear interpolations between these points (at 26%, 6.66% of options are exercised, at 27%, 13.32%, etc.).*

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NOTES

1 *In this chapter we use the terms founder, creator or manager of a start-up as synonyms for entrepreneurs*.

2 *Synonym in this chapter for young company*.

3 *For more on discounting, see Chapter 16.*

4 *647,000 / (1,000,000 + 647,000) = 39.3%.*

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Chapter 41
SHAREHOLDERS

What a cast of characters!

Section 41.1 SHAREHOLDER STRUCTURE

Our objective in this section is to demonstrate the importance of a company's shareholder structure. While the study of finance generally includes a clear description of why it is important to value a company and its equity, analysis of who owns its shares and how shareholders are organised is often neglected. Yet in practice this is where investment bankers often look first.

There are several reasons for looking closely at the shareholder base of a company. Firstly, the shareholders theoretically determine the company's strategy, but we must understand who really has power in the company, the shareholders or the managers. You will undoubtedly recognise the mark of “agency theory”. This theory provides a theoretical explanation of shareholder–manager problems.

Secondly, we must know the objectives of the shareholders when they are also the managers. Wealth? Power? Fame? In some cases, the shareholder is also a customer or supplier of the company. In an agricultural cooperative, for example, the shareholders are upstream in the production process. The cooperative company becomes a tool serving the needs of the producers, rather than a profit centre in its own right. This is probably why many agricultural cooperatives are not very profitable.

Lastly, disagreement between shareholders can paralyse a company, particularly a family-owned company.

As a last word, do not forget, as seen in Chapter 26, that in the financial world everything has a price, or better, everything can create or destroy value.

1/ DEFINITION OF SHAREHOLDER STRUCTURE

The shareholder structure (or shareholder base) is the percentage ownership and the percentage of voting rights held by different shareholders. When a company issues shares with multiple voting rights or non-voting preference shares or represents a cascade of holding companies, these two concepts are separate and distinct. A shareholder with 33% of the shares with double voting rights will have more control over a company where the remaining shares are widely held than will a shareholder with 45% of the shares with

single voting rights if two other shareholders hold 25% and 30%. A shareholder who holds 20% of a company's shares directly and 40% of the shares of a company that holds the other 80% will have rights to 52% of the company's earnings but will be in the minority for decision-taking. In the case of companies that issue equity-linked instruments (convertible bonds, warrants, stock options) attention must be paid to the number of shares currently outstanding versus the fully diluted number of potential shares.

> Shareholder structure is the study of how power is distributed among the different shareholders and potential shareholders.

Studying the shareholder structure depends very much on the company being listed or not. In unlisted companies, the equilibrium between the different shareholders depends heavily on shareholders' agreements which are often in place, but rarely public and difficult to gain access to for the external analyst, impacting the relevancy of their analysis. For a listed company, shareholder attendance at previous general meetings should be analysed. If attendance has been low, a shareholder with a large minority stake could have de facto control, like Bolloré at Vivendi, in which it only has 29% of the voting rights.

Lastly, we should mention **nominee** (warehousing) **agreements** even though they are rarely used these days. Under a nominee agreement, the “real” shareholders sell their shares to a “nominee” and make a commitment to repurchase them at a specific price, usually in an effort to remain anonymous. A shareholder may enter into a nominee agreement for one of several reasons: transaction confidentiality, group restructuring or deconsolidation, etc. Conceptually, the nominee extends credit to the shareholder and bears counterparty and market risk. If the issuer runs into trouble during the life of the nominee agreement, the original shareholder will be loath to buy back the shares at a price that no longer reflects reality. As a result, nominee agreements are difficult to enforce. Moreover, they can be invalidated if they create an inequality among shareholders. We do not recommend the use of nominee agreements. The modern form for listed companies is the equity swap.[1]

2/ LEGAL FRAMEWORK

Theoretically, in all jurisdictions, the ultimate decision-making power lies with the shareholders of a company. They exercise it through the assembly of a shareholders' Annual General Meeting (AGM). Nevertheless, the types of decisions can differ from one country to another. Generally, shareholders decide on:

appointment of board members;

appointment of auditors;

approval of annual accounts;

distribution of dividends;

changes in articles of association (i.e. the constitution of a company);

mergers;

capital increases and share buy-backs;

dissolution (i.e. the end of the company).

In most countries – depending on the type of decision – there are two types of shareholder vote: ordinary and extraordinary.

At an Ordinary General Meeting (OGM) of shareholders, shareholders vote on matters requiring a simple majority of voting shares. These include decisions regarding the ordinary course of the company's business, such as approving the financial statements, payment of dividends and appointment and removal of members of the board of directors.

At an Extraordinary General Meeting (EGM) of shareholders, shareholders vote on matters that require a change in the company's articles of association: share issues, mergers, asset contributions, demergers, share buy-backs, etc. These decisions require a qualified majority. Depending on the country and on the legal form of the company, this qualified majority is generally two-thirds or three-quarters of outstanding voting rights.

The main levels of control of a company in various countries are as follows:

	Supermajority	**Type of decision**

	Supermajority	Type of decision
Brazil	1/2	Changes in the objective of the company Merger, demerger Dissolution Changes in preferred share characteristics
China	2/3	Increase or reduction of the registered capital Merger, split-up Dissolution of the company Change of the company form
France	2/3	Changes in the articles of association Merger, demerger Capital increase and decrease Dissolution
Germany	3/4	Changes in the articles of association Reduction and increase of capital Major structural decisions Merger or transformation of the company
India	3/4	Merger
Italy	—	Defined in the articles of association
Netherlands	2/3	Restrictions in pre-emption rights Capital reduction
Russia	3/4	Changes in the articles of association Reorganisation of the company Liquidation Reduction and increase in capital Purchase of own shares Approval of a deal representing more than 50% of the company's assets
Spain	—	Defined in the articles of association
Switzerland	2/3	Changes in purpose Issue of shares with increased voting powers Limitations of pre-emption rights Change of location Dissolution

	Supermajority	Type of decision
UK	3/4	Altering the articles of association Disapplying members' statutory pre-emption rights on issues of further shares for cash Capital decrease Approving the giving of financial assistance/purchase of own shares by a private company or, off market, by a public company Procuring the winding up of a company by the court Voluntarily winding up a company
USA	—	Defined on a state level and frequently in the articles of association

Shareholders holding less than the blocking minority (if this concept exists in the country) of a company that has another large shareholder with a majority, have a limited number of options open to them. They cannot change the company objectives or the way it is managed. At best, they can force compliance with disclosure rules, or call for an audit or an EGM. Their power is most often limited to being that of a naysayer. In other words, a small shareholder can be a thorn in management's side, but no more. Nevertheless, the voice of the minority shareholder has become a lot louder and a number of them have formed associations to defend their interests. Shareholder activism has become a defence tool where the law had failed to provide one.

It should be noted that in some countries (Sweden, Norway, Portugal) minority shareholders can force the payment of a minimum dividend. In some countries, all shareholders, irrespective of the number of shares they hold, have the right to ask questions in writing at the General Meeting. The company must answer them publicly at the latest on the day of the meeting.

A shareholder who holds a blocking minority (one-quarter or one-third of the shares plus one share depending on the country and the legal form of the company) can veto any decision taken in an extraordinary shareholders' meeting that would change the company's articles of association, company objects or called-up share capital.

A blocking minority is in a particularly strong position when the company is in trouble, because it is then that the need for operational and financial restructuring is the most pressing. The power of blocking minority shareholders can also be decisive in periods of rapid growth, when the company needs additional capital.

The notion of a blocking minority is closely linked to exerting control over changes in the company's articles of association. Consequently, the more specific and inflexible the articles of association are, the more power the holder of a blocking minority wields.

> A blocking minority does not give its holder control over decisions taken at ordinary shareholders' meetings (dividend payout, etc.). It gives veto power, not direct power.

3/ THE DIFFERENT TYPES OF SHAREHOLDERS

(a) The family-owned company

By “family-owned” we mean that the shareholders have been made up of members of the same family for several generations and, often through a holding company, exert significant influence over management. This is still the dominant model in Europe. The following table shows the shareholder base of the 50 largest companies by market capitalisation in several countries (2021):

Shareholding	Germany	Switzerland	USA	France	Italy	UK
Widely spread	50%	54%	84%	43%	20%	82%
Family (and non-listed)	20%	32%	14%	31%	38%	6%
State and local authorities	10%	8%	0%	14%	22%	4%
Financial institution	2%	4%	0%	6%	12%	6%
Other listed firms	18%	2%	2%	6%	8%	2%

Source: Company data, FactSet.

However, this type of shareholder structure is on the decline for several reasons:

some new or capital-intensive industries, such as energy/utilities and banks require so much capital that a family-owned structure is not viable over the long term. Indeed, family ownership is more suited to consumer goods, retailing, services, processing, etc.;

financial markets have matured and financial savings are now properly rewarded, so that, with rare exceptions, diversification is a better investment strategy than concentration on a specific risk (see Section 18.6);

increasingly, family-owned companies are being managed on the basis of financial criteria, prompting the family group either to exit the capital or to dilute the family's interests in a larger pool of investors that it no longer controls. This trend requires a nuanced view as, in recent years, certain young companies whose founders remain very important shareholders (Contentsquare, Doordash, Iliad, and so on) have taken up a prominent role within the economy.

Family shareholding sometimes reappears in the form of family offices, emanating from large industrial families (Desmarais in Canada, Quandt in Germany, Frère in Belgium, etc.) that invest in financial fundamentals, but with a much longer-term perspective than traditional funds.

Some research has demonstrated that family-owned companies register on average better performance than non-family-owned companies. Having most of your wealth in one single company or group is a strong incentive to properly monitor its managers or to act responsibly as its manager.

(b) Business angels

See Chapter 40.

(c) Private equity funds

Private equity funds, financed by insurance companies, pension funds or wealthy investors, play a major role. In most cases these funds specialise in a certain type of investment: venture capital, development capital, LBOs (see Chapter 47) or turnaround capital, which correspond to a company's different stages of maturity.

Venture capital funds focus on bringing seed capital, i.e. equity, to start-ups to finance their early developments.

Development capital funds become shareholders of high-growth companies that require substantial funds.

LBO funds invest in companies put up for sale by a group looking to refocus on its core business or by a family-held group faced with succession problems, or help a company whose shares are depressed (in the opinion of the management) to delist itself in a **public-to-private** (P-to-P) transaction. LBO funds are keen to get full control over a company (but control can be exercised by 2 or 3 funds) in order to reap all of the rewards and also to make it possible to restructure the company as they think best, without having to worry about the interests of minority shareholders. Therefore, they usually prefer the target companies not to be listed (or to be delisted if the target was public), but the fund itself can be listed.

Turnaround funds work with distressed companies, helping them to turn themselves around.

Activist funds have made a speciality of putting public pressure on poorly performing or badly structured groups, proposing corrective measures to improve their value. In 2020, for example, Amber was proposing a complete overhaul of Lagardère's board of directors, a change of strategy and the abandonment of the limited partnership status that protects the founder's heir, who has not demonstrated the same qualities. This has been implemented in 2021.

Managed by teams of investment professionals whose compensation is largely linked to performance, these funds have a limited lifespan (no more than 10 years). Before the fund is closed, the companies that the fund has acquired are resold, floated on the stock exchange or the fund's investments are taken over by another fund.

Some private equity funds take a minority stake in listed companies, a PIPE (private investment in public equity), helping the management to revitalise the company so as to make a capital gain. For example, in 2019, Searchlight Capital took a 26% stake in Latécoère and changed the CEO in 2020. In 2020–2021, the creation of SPACs by private equity funds allowed them to

invest in companies on a minority basis when they went public using this technique.

Private equity funds play an important role in the economy and are a real alternative to a listing on the stock exchange. They solve agency problems by putting in place strict reporting from the management, which is incentivised through management packages and the pressure of debt (LBO funds).

They also bring a cash culture to optimise working capital management and limit capital expenditure to reasonably value-creating investments. Private equity funds are ready to bring additional equity to finance acquisitions with an industrial logic. They also bring to management a capacity to listen, to advise and to exchange, which is far greater than that provided by most institutional investors. They are professional shareholders who have only one aim – to create value – and they do not hesitate to align the management of companies they invest in with that objective.

(d) Institutional investors

Institutional investors are banks, asset managers, insurance companies, pension funds and unit trusts that manage money on behalf of private individuals. Most of the time they individually own minor stakes (less than 10%), but they play a much bigger role as they define the stock market price of companies in which they collectively represent the major part of their floating capital.

Because of new regulations on corporate governance (see Chapter 43), they vote at AGMs more frequently, especially to defeat resolutions they do not like, notably regarding excessive compensation.

(e) Financial holding companies

Large European financial holding companies such as Deutsche Bank, Paribas, Mediobanca, Société Générale de Belgique, etc. played a major role in creating and financing large groups. In a sense, they played the role of the (then-deficient) capital markets. Their gradual disappearance or mutation has led to the breakup of core shareholder groups and cross-shareholdings. Today, in emerging countries (Korea, India, Colombia), large

industrial and financial conglomerates play their role (Samsung, Tata, Votorantim, etc.).

(f) Employee-shareholders

Many companies have invited their employees to become shareholders. In most of these cases, employees hold a small proportion of the shares, although in a few cases the majority of the shares. This shareholder group, loyal and non-volatile, lends a degree of stability to the capital and, in general, strengthens the position of the majority shareholder, if any, and of the management.

The main schemes to incentivise employees are:

Direct ownership. Employees and management can invest directly in the shares of the company. In LBOs, private equity sponsors bring the management into the shareholding structure to minimise agency costs.

Employee stock ownership programmes (ESOPs). ESOPs consist in granting shares to employees as a form of compensation. Alternatively, the shares are acquired by shareholders but the firm will offer free shares so as to encourage employees to invest in the shares of the company. The shares will be held by a trust (or employee savings plan) for the employees. Such programmes can include lock-up clauses to maintain the incentive aspect and limit flowback (see Section 25.2). In this way, the shares allocated to each employee will vest (i.e. become available) gradually over time.

Stock options. Stock options are a right to subscribe to new shares or shares held by the company as treasury stocks at a certain point in time.

For service companies and fast-growing companies, it is key to incentivise employees and management with shares or stock options, as the key assets of such companies are their people. For other companies, offering stock to employees can be part of a broader effort to improve employee relations (all types of companies) and promote the company's image internally. The success of such a policy largely depends on the overall corporate mood. In large companies, employees can hold up to 10%. Lehman, the US investment bank, was one of the listed companies with the largest employee shareholdings (c. 25%) when it went into meltdown in 2008.

Regardless of the type of company and its motivation for making employees shareholders, you should keep in mind that the special relationship between the company and the employee-shareholder cannot last forever. Prudent investment principles dictate that the employee should not invest too heavily in the shares of the company that pays their salaries, because in so doing they, in fact, compound the “everyday life” risks they are running.[2]

Basically, the company should be particularly fast-growing and safe before the employee agrees to a long-term participation in the fruits of its expansion. Most often, this condition is not met. Moreover, just because employees hold stock options does not mean they will be loyal or long-term shareholders. The LBO models we will study in Chapter 47 become dangerous when they make a majority of the employees shareholders. In a crisis, the employees may be keener to protect their jobs than to vote for a painful restructuring. When limited to a small number of employees, however, LBOs create a stable, internal group of shareholders.

(g) Governments

In Europe and the USA, governments' role as the major shareholders of listed groups is fading, even if they are still majority shareholders of large industry players (Deutsche Bahn, EDF, Enel) or playing a key role in some groups like Deutsche Telekom, Airbus or Eni. State ownership had a period of revival thanks to the economic crisis, as some groups were taken over to avoid collapse (General Motors, RBS) or funds were injected through equity issues to reinforce financial institutions (Citi, ING, etc.).

At the same time, **sovereign wealth funds**, mostly created by emerging countries and financed thanks to reserves from staples, are gaining importance as long-term shareholders. They are normally very financially minded, but their opacity, their size (often between €50bn and €500bn) and their strong connections with mostly undemocratic states are worrying to some. As of end 2020, they had c. $9,070bn under management, and slowly growing. The most well-known include The Government Pension Fund of Norway, Norges ($1,290bn), China Investment Company (CIC, $1,045bn), SAFE Investment Company and Hong Kong Monetary Authority ($978bn) from China, Abu Dhabi Investment Authority (ADIA, $745bn), GIC and Temasek in Singapore ($710bn), Kuwait Investment Authority (KIA,

$562bn), etc. They are majority shareholders of a number of firms (Singapore Airlines, P&O, etc.) and minority shareholders in some listed firms such as the London Stock Exchange, Glencore, KKR, Carlyle, Foncia, etc.

(h) Crossholdings

Crossholdings peaked before the 1990s when capitalism was often capital-less. Today, the very few examples (Renault owns 43% of Nissan, which owns 15% of Renault, Spotify owns 9% of Tencent Music, which owns 7.5% of Spotify) are there to promote industrial synergies, or even to prepare for a closer future relationship, and not for financial or power reasons.

4/ SHAREHOLDERS' AGREEMENT

Minority shareholders can protect their interests by crafting a shareholders' agreement with other shareholders.

A shareholders' agreement is a legal document signed by several shareholders to define their future relationships. It complements the company's articles of association. Most of the time, the shareholders' agreement is confidential except for listed companies in countries which require its publication in order for it to be valid.

They mainly contain two sets of clauses:

clauses that organise corporate governance: breakdown of directors' seats, the nomination of the chairperson, of the CEO, of the auditors; how major decisions are taken, including capex; financing, acquisitions, share issues, dividend policy; how to vote during annual general meetings; what kind of information is disclosed to shareholders, etc.;

clauses that organise the sale or purchase of shares in the future: lock-up, right of first refusal if one shareholder wants to exit, drag-along (to force the disposal of 100% of the shares if the majority shareholders or several shareholders holding a majority stake between them wish to exit) or tag-along (to allow minority shareholders to benefit from the same transaction conditions if the majority shareholder is selling), caps and floors, etc.

For shareholders' agreement on start-ups, please see Section 40.4.

As we will see below, the stock exchange probably offers minority shareholders the best protection.

Section 41.2 HOW TO STRENGTHEN CONTROL OVER A COMPANY

Defensive measures for maintaining control of a company always carry a cost. From a purely financial point of view, this is perfectly normal: there are no free lunches!

> Measures to preserve control are not only costly to put in place but also effectively preclude the company from accessing certain financial instruments. These costs are borne by current shareholders and ultimately by the company itself in the form of a higher cost of capital.

With this in mind, let us now take a look at the various takeover defences. We will see that they vary greatly depending on the country, on the existence or absence of a regulatory framework and on the powers granted to companies and their executives. Certain countries, such as the UK and, to a lesser extent, France and Italy, regulate anti-takeover measures strictly, while others, such as the Netherlands and the USA, allow companies much more leeway.

Broadly speaking, countries where financial markets play a significant role in evaluating management performance, because companies are more widely held, have more stringent regulations. This is the case in the UK and France.

Conversely, countries where capital is concentrated in relatively few hands have more flexible regulation. This goes hand in hand with the articles of association of the companies, which ensure existing management a high level of protection. In Germany, half of the seats on the board of directors are reserved for employees, and board members can be replaced only by a 75% majority vote.

Paradoxically, when the market's power to inflict punishment on companies is unchecked, companies and their executives may feel such insecurity that they agree to protect themselves via the articles of association. Sometimes this contractual protection is to the detriment of the company's welfare and of free market principles. This practice is common in the US.

Defensive measures fall into four categories:

Separate management control from financial control:

- different classes of shares: shares with multiple voting rights and non-voting shares;
- holding companies;
- limited partnerships.

Control shareholder changes:

- right of approval;
- pre-emption rights.

Strengthen the position of loyal shareholders:

- reserved capital increases;
- share buy-backs and cancellations;
- mergers and other tie-ups;
- employee shareholdings;
- warrants.

Exploit legal and regulatory protection:

- regulations;
- voting caps;
- strategic assets;
- change-of-control provisions.

In order to defend itself, a company must know who its shareholders are. This is relatively easy for unlisted companies for which shares must be nominative, but a lot more complicated for listed companies, where most of the shares are bearer shares (the identity of the shareholder is unknown to the company). In this way, some companies are able to make provision for the notification obligation, set out in the articles of association, when a minimum threshold (0.5%, for example) of the share capital has been breached, which is in addition to statutory obligations starting at 3 or 5% in most countries (see Section 45.3).

1/ SEPARATING MANAGEMENT CONTROL FROM FINANCIAL CONTROL

Shareholders are more and more reluctant to vote for schemes that go against the principle *one share, one vote* or that make a change in control more complex.

(a) Different classes of shares: shares with multiple voting rights and non-voting shares

As an exception to the general rule, under which the number of votes attributed to each share must be directly proportional to the percentage of the capital it represents (principle of one share, one vote), companies in some countries have the right to issue multiple-voting shares or non-voting shares.

In the Netherlands, the USA, Luxembourg, and the Scandinavian countries, dual classes of shares are not infrequent. The company issues two (or more) types of shares (generally named A shares and B shares) with the same financial rights but with different voting rights.

French corporate law provides for the possibility of double-voting shares but, contrary to dual-class shares, all shareholders can benefit from the double-voting rights if they hold the shares for a certain time.

Multiple-voting shares can be particularly powerful; for example, the founders of Alphabet (ex. Google) have 53.1% of voting rights of Alphabet while they hold only 11.6% of the shares. Ford, Snap, Lyft, Facebook, and Roche, have also put in place this type of capital structure. These dual-class shares can appear as unfair and contrary to the principle that the person who provides the capital gets the power in a company. Some countries (Italy, Spain, Belgium and Germany) have outlawed dual-class shares.

(b) Holding companies

Holding companies can be useful but their intensive use leads to complex, multi-tiered shareholding structures. As you might imagine, they present both advantages and disadvantages.

Suppose an investor holds 51% of a holding company, which in turn holds 51% of a second holding company, which in turn holds 51% of an industrial company. Although they hold only 13% of the capital of this industrial company, the investor uses a cascade of holding companies to maintain control of the industrial company.

A holding company allows a shareholder to maintain control over a company, because a structure with a holding disperses the minority shareholders. Even if the industrial company were floated on the stock exchange, the minority shareholders in the different holding companies would not be able to sell their stakes.

Maximum marginal personal income tax is generally higher than income taxes on dividends from a subsidiary. Therefore, a holding company structure allows the controlling shareholder to draw off dividends with a minimum tax bite and use them to buy more shares in the industrial company.

Technically, a holding company can “trap” minority shareholders; in practice, this situation often leads to an ongoing conflict between shareholders. For this reason, holding companies are usually based on a group of core shareholders intimately involved in the management of the company.

A two-tiered holding company structure often exists, where:

a holding company controls the operating company;

a top holding company holds the controlling holding company. The shareholders of the top holding company are the core group. This top holding company's main purpose is to buy back the shares of minority shareholders seeking to sell some of their shares.

Often, a holding company is formed to represent the family shareholders prior to an IPO.

(c) Limited share partnerships (LSPs)

A limited share partnership introduces a complete separation between management and financial ownership of the company.

A limited share partnership is a company where the share capital is divided into shares, but with two types of partners:

several limited partners with the status of shareholders, whose liability is limited to the amount of their investment in the company. A limited share partnership is akin to a public limited company in this respect;

one or more general partners, who are jointly liable, to an unlimited extent, for the debts of the company. Senior executives of the company are usually general partners, with limited partners being barred from the executive suite.

The company's articles of association determine how present and future executives are to be chosen. These top managers have the most extensive powers to act on behalf of the company in all circumstances. They can be fired only under the terms specified in the articles of association. In some countries, the general partners can limit their financial liability by setting up a (limited liability) family holding company. In addition, the LSP structure allows a change in management control of the operating company to take place within the holding company. For example, a father can hand over the reins to his daughter, while the holding company continues to perform its management functions.

Thus, theoretically, the chief executive of a limited share partnership can enjoy absolute and irrevocable power to manage the company without owning a single share. Management control does not derive from financial control as in a public limited company, but from the stipulations of the by-laws, in accordance with applicable law. Several large listed companies have adopted limited share partnership form, including Merck KGaA, Henkel, Michelin and Hermès.

(d) Non-voting shares

Issuing non-voting shares is similar to issuing dual-class shares because some of the shareholders will bring capital without getting voting power. Nevertheless, issuing non-voting shares is a more widely spread practice than issuing dual-class shares. Actually, in compensation for giving up their voting rights, holders of non-voting shares usually get preferential treatment regarding dividends (fixed dividend, higher dividend compared to ordinary shares, etc.). Accordingly, non-voting (preference) shares are not perceived

as unfair but as a different arbitrage for the investor between return, risk and power in the company. For more, see Section 24.3.

2/ CONTROLLING SHAREHOLDER CHANGES

(a) Right of approval

The right of approval, written into a company's articles of association, enables a company to avoid “undesirable” shareholders or shift the balance between shareholders. This clause is frequently found in family-owned companies or in companies with a delicate balance between shareholders. The right of approval governs the relationship between partners or shareholders of the company; be careful not to confuse it with the type of approval required to purchase certain companies (see below).

Technically, the right of approval clause requires all partners to obtain the approval of the company prior to selling any of their shares to a third party, or to another shareholder if explicitly provided for in the approval clause. The company must render its decision within a specified time period. If no decision is rendered, the approval is deemed granted.

If it refuses, the company, its board of directors, executive committee, senior executives or a third party must buy back the shares within a specified period of time, or the shareholder can consummate the initially planned sale.

The purchase price is set by agreement between the parties, or in the event that no agreement is reached, by independent appraisal.

Right of approval clauses might not be applied when shares are sold between a shareholder, their spouse or their immediate family and descendants.

Most of the time, right of approval clauses for listed companies are prohibited as they run contrary to the fluidity implied in being a public company.

(b) Pre-emption rights

Equivalent to the right of approval, the pre-emption clause gives a category of shareholders or all shareholders a priority right to acquire any shares

offered for sale. Companies whose existing shareholders want to increase their stake or control changes in the capital use this clause. The board of directors, the chief executive or any other authorised person can decide how shares are divided amongst the shareholders.

Technically, pre-emption rights procedures are similar to those governing the right of approval.

Most of the time, pre-emption rights do not apply in the case of inherited shares, liquidation of a married couple's community property, or if a shareholder sells shares to their spouse, immediate family or descendants.

Right of approval and pre-emption rights clauses constitute a means of controlling changes in the shareholder structure of a company. If the clause is written into the articles of association and applies to all shareholders, it can prevent any undesirable third party from obtaining control of the company. These clauses cannot block a sale of shares indefinitely, however. The existing shareholders must always find a solution that allows a sale to take place if they do not wish to buy.

3/ STRENGTHENING THE POSITION OF LOYAL SHAREHOLDERS

(a) Reserved share issues

In some countries, a company can issue new shares on terms that are highly dilutive for the existing shareholders. For example, to fend off a challenge from the newspaper group Gannet, the Tribune Publishing group (publisher of *The Chicago Tribune* and *The Los Angeles Times*) issued 13% of its share capital in May 2016 to Patrick Soon-Shiong, placing the billionaire as Tribune's second-largest shareholder.

The new shares can be purchased either for cash or for contributed assets. For example, a family holding company can contribute assets to the operating company to strengthen its control over this company.

(b) Mergers

Mergers are, first and foremost, a method for achieving strategic and industrial goals. As far as controlling the capital of a company is concerned, a merger can have the same effect as a reserved capital increase, by diluting

the stake of a hostile shareholder or bringing in a new friendly shareholder. We will look at the technical aspects in Chapter 46.

The risk, of course, is that the new shareholders, initially brought in to support existing management, will gradually take over control of the company.

(c) Share buy-backs and cancellations

This technique, which we studied in Chapter 37 as a financial technique, can also be used to strengthen control over the capital of a company. The company offers to repurchase a portion of outstanding shares with the intention of cancelling them. As a result, the percentage ownership of the shareholders who do not subscribe to the repurchase offer increases. In fact, a company can regularly repurchase shares. For example, Bic and Norilsk Nickel have used this method several times in order to strengthen the control of large shareholders.

(d) Employee shareholdings

Employee-shareholders generally have a tendency to defend a company's independence when there is a threat of a change in control. A company that has taken advantage of the legislation favouring different employee share-ownership schemes can generally count on a few percentage points of support in its effort to maintain the existing equilibrium in its capital. In 2007, for example, the employee-shareholders of the construction group Eiffage rallied behind management in its effort to see off Sacyr's rampant bid.

(e) Warrants

The company issues warrants to certain investors. If a change in control threatens the company, investors exercise their warrants and become shareholders. This issue of new shares will make a takeover more difficult, because the new shares dilute the ownership stake of all other shareholders. The strike price of the warrant is usually very attractive but the warrants can only be exercised if a takeover bid is launched on the company.

This type of provision is common in the Netherlands (ING or Philips), France (Peugeot, Bouygues) and the US. In 2018, both Bouygues' and

Peugeot's AGM authorised their boards to issue such warrants should they find it necessary.

4/ LEGAL AND REGULATORY PROTECTION

(a) Regulations

Certain investments or takeovers require approval from a government agency or other body with vetoing power. In most countries, sectors where there are needs for specific approval are:

financial institutions;

activities related to defence (for national security reasons);

media;

etc.

Golden shares are special shares that enable governments to prevent another shareholder from increasing its stake above a certain threshold, or the company from selling certain of its assets (Distrigas, Telecom Italia, Eni are some examples).

(b) Voting caps

In principle, the very idea of limiting the right to vote that accompanies a share of stock contradicts the principle of “one share, one vote”. Nevertheless, in some countries, companies can limit the vote of any shareholder to a specific percentage of the capital. In some cases, the limit falls away once the shareholder reaches a very large portion of the capital (e.g. 50% or 2/3).

For example, Danone's articles of association stipulate that no shareholder may cast more than 6% of all single voting rights and no more than 12% of all double voting rights at a shareholders' meeting, unless they own more than two-thirds of the shares. Voting caps are commonly used in Europe, specifically in Switzerland (12 firms out of the 50 largest use them), France, Belgium, the Netherlands and Spain. Nestlé, Total, and Novartis all use voting caps.

This is a very effective defence. It prevents an outsider from taking control of a company with only 20% or 30% of the capital. If they truly want to take control, they have to “up the ante” and bid for all of the shares. We can see that this technique is particularly useful for companies of a certain size. It makes sense only for companies that do not have a strong core shareholder.

(c) Strategic assets (poison pills)

Strategic assets can be patents, brand names or subsidiaries comprising most of the business or generating most of the profits of a group. In some cases the company does not actually own the assets but simply uses them under licence. In other cases these assets are located in a subsidiary with a partner who automatically gains control should control of the parent company change hands. Often contested as misuse of corporate property, poison pill arrangements are very difficult to implement, and in practice are generally ineffective. In 2021, Suez tried to fend off Veolia's bid by housing its French water business in a foundation in the Netherlands to make it non-transferable.

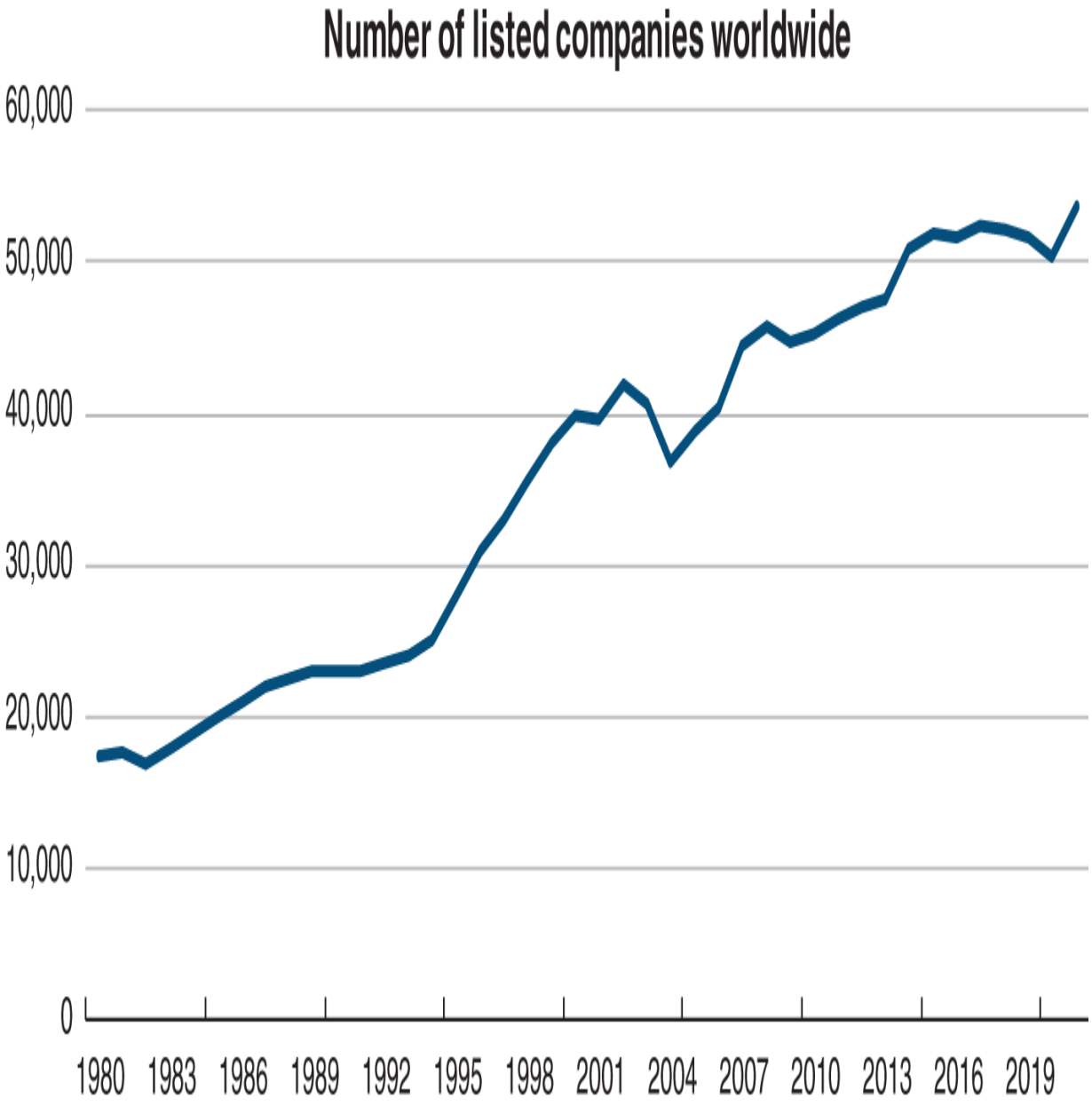
(d) Change-of-control provisions

Some contracts may include a clause whereby the contract becomes void if one of the control provisions over one of the principles of the contract changes. The existence of such clauses in vital contracts for the company (distribution contract, bank debt contract, commercial contract) will render its takeover much more complex.

Some “golden parachute” clauses in employment contracts allow employees to leave the company with a significant amount of money in the event of a change of control, which consequently has a dissuasive effect.

Section 41.3 STOCK MARKET OR INVESTMENT FUND SHAREHOLDING?

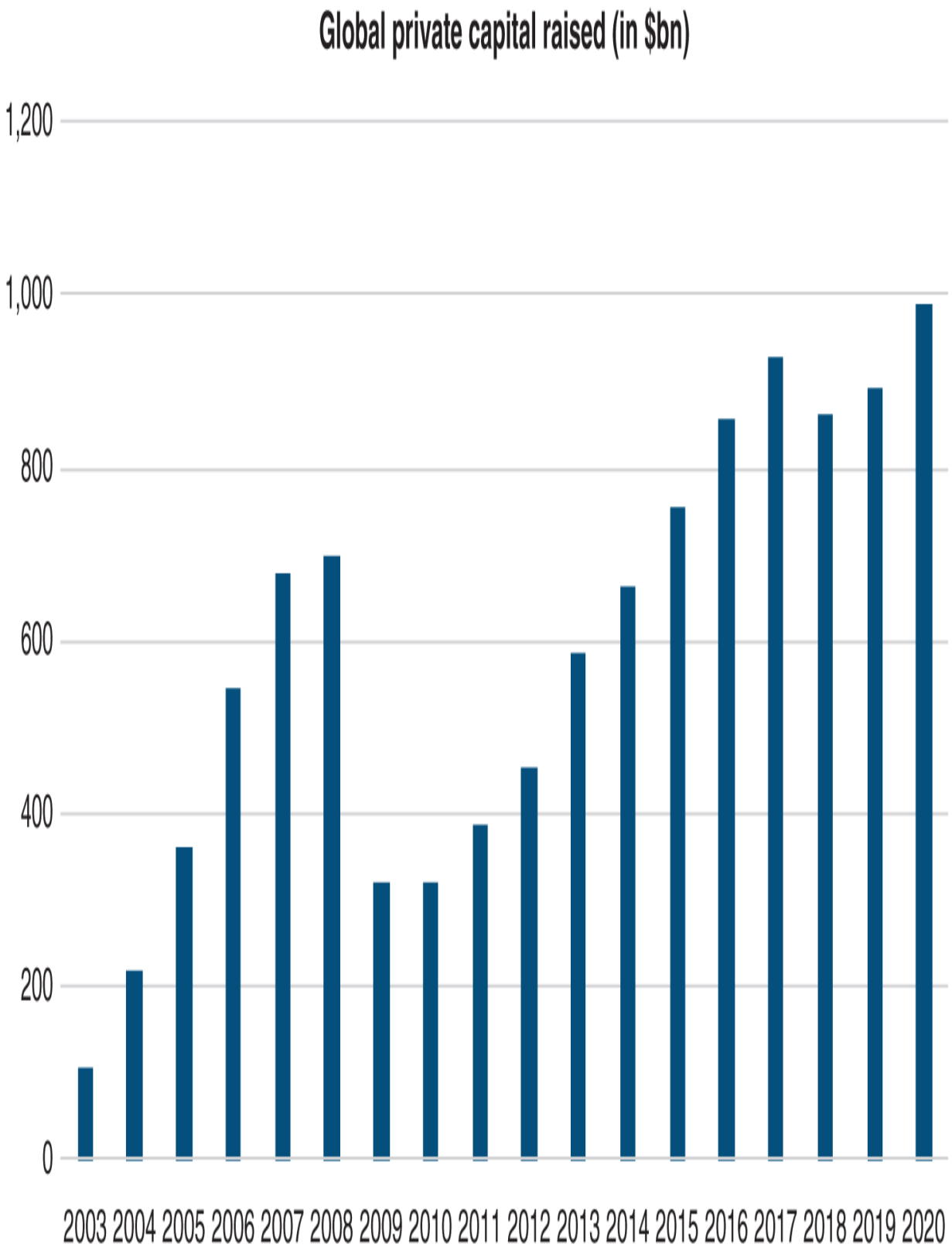
The disenchantment with stock markets and the rise of unlisted investments is a fundamental trend that is not about to stop. While the number of listed companies worldwide has stagnated since 2015 at just over 50,000, in the United States it has been declining since 1997, now less than half the number of the companies listed on the stock exchange as in 1997.



Source: Data from World Federation of Exchanges

As nature abhors a vacuum and with companies less attracted by the stock market, investment in unlisted, or private, equity is growing apace. Its precise definition is unclear and differs from one source to another. Let's say that it covers all investments made through investment funds in unlisted companies or companies that become unlisted on that occasion, or in unlisted assets (such as real estate or natural resources).

Preqin estimates that private equity funds raised in 2020 amounted to $989bn significantly higher than pre-2008 records:



Source: Data from Preqin, quoted in 'Global private equity report 2021', Bain & Company

Even if 2020 was a record year for IPOs ($353bn), the funds provided by private equity remain much higher.

1/ THE ORIGIN OF INVESTMENT FUNDS

The origins of unlisted investment in its modern form can be traced back to the United States when, after the Second World War, a Harvard management professor, Georges Doriot, set up the world's first venture capital company, AR&D, in the Boston area. With funds provided in particular by the John Hancock insurance company and MIT, AR&D financed DEC from its beginnings in 1957, which was a huge success and became the second largest computer manufacturer in the world before its takeover in 1999 by Compaq, which itself merged with HP in 2002.

In the United Kingdom, private equity initially took the form of minority investments to help SMEs or second tier companies to grow and turn into groups. The unlisted, fund-managed sector developed later in continental Europe, where development capital had been pre-empted at the beginning of the 20th century by listed financial companies, the best known of which were Mediobanca, Paribas, Suez, Générale de Belgique, Deutsche Bank, Commerzbank, etc.

Then in the 1980s, a genetic mutation took place in the world of unlisted investing with the appearance and then the development of LBO funds[3] taking full control of a target, a new occurrence as unlisted investing had previously limited itself to minority stakes. The refocusing of listed groups, spurred on by the development of the concept of value creation, the end of the large conglomerates (General Electric plc, Saint-Gobain, ITT, etc.), and the succession of family businesses created in the immediate post-war period, provided a breeding ground for the development of this new form of private equity.

The long phase of falling interest rates and the correlative rise in valuation multiples (which favours financial performance), the renewed motivation of the managers of acquired divisions (often managed very loosely) through management packages, and the focus on cash and profitability, combined with the leverage effect of debt, explain the very high returns on investment that attract and retain investors. Over the years, the success of LBOs has been considerable, so much so that for many, *private equity* has become

synonymous with LBO funds. From being a temporary lock between a family shareholder or a division of a group and the stock market or another group, LBOs have become a means of long-term ownership of companies with the development of secondary and tertiary LBOs, etc., such as Optven for example.

Buoyed by their success, some of the historical LBO funds (KKR, Blackstone, Apollo, Ardian, etc.) are expanding their activities to include investments in private debt, infrastructure, development capital, venture capital, real estate, distressed companies, natural resources, minority stakes in listed companies, etc. As a result, McKinsey estimates that in 2019 private equity, in its broadest sense, will manage $6,500bn, up 12% over 2018.

Although it has been growing since 2002 at twice the rate of world market capitalisation, and has multiplied its outstandings by more than seven since then, the unlisted market still represents only around 7% of world market capitalisation ($109,210bn at the end of 2020), compared with half as much in 2000.

Although this share may seem small, we no longer meet investors today who say they are not interested in private equity. On the contrary, most want to increase the proportion of their assets allocated to this type of investment, which has now become mainstream.

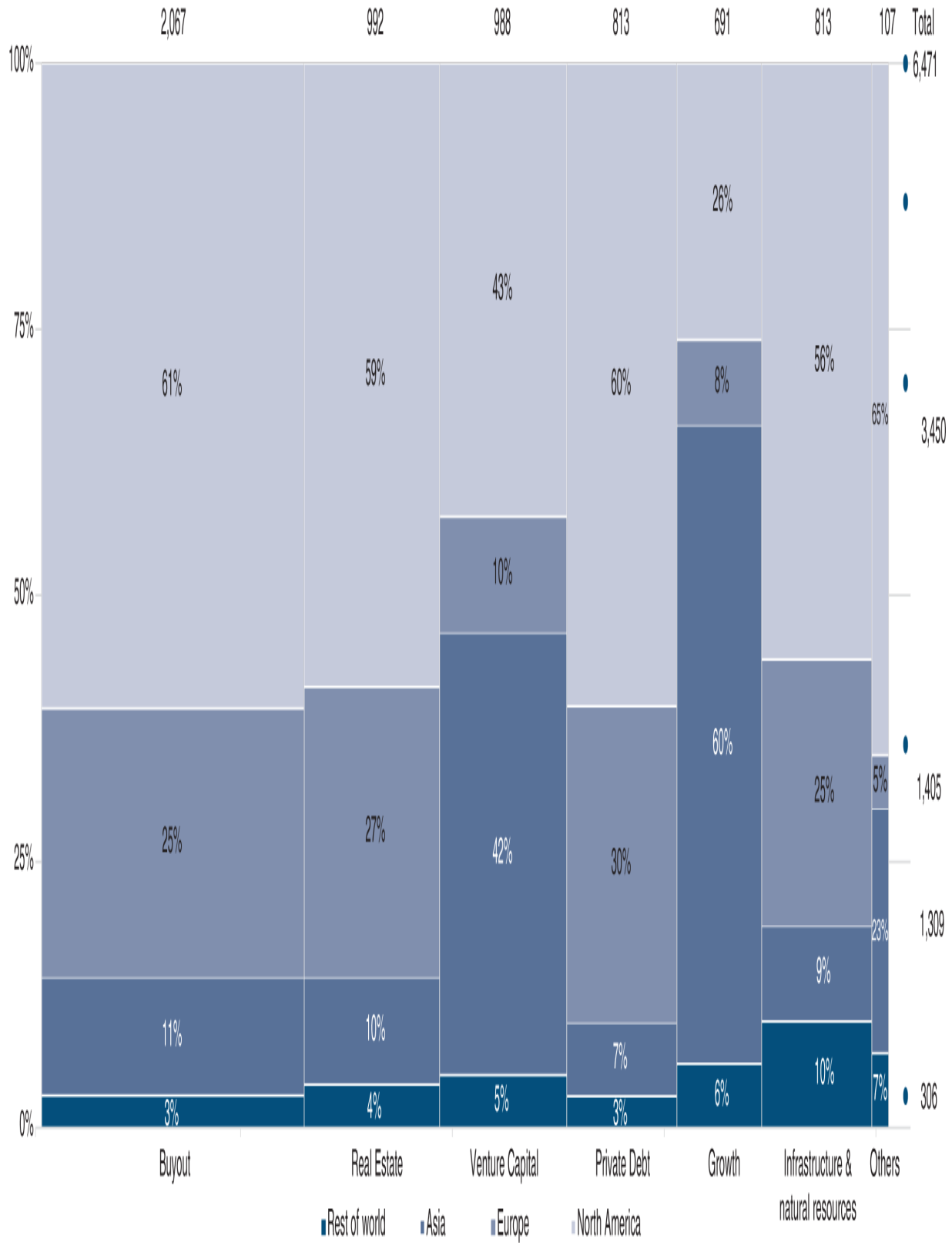
So much so that a number of major investors, sovereign wealth funds, family offices and pension funds have developed their own tools and structures for investing in the unlisted market in a traditional manner.

2/ THE GROWING COMPLEXITY OF LIFE ON THE STOCK MARKET

Market windows are periods when the stock market felt able to subscribe to capital increases or to welcome new recruits into its ranks. Outside those ranks, there was no salvation and the only thing to do was wait. Hence sometimes after a few months of preparing a financial transaction, it has to be cancelled on the eve of the launch! All this because a competitor's quarterly results are 2% below expectations and its share price has fallen 10–15%, or because a central bank has not announced the expected quarter-

point drop in its refinancing rate. You have to have nerves of steel and have your plan B ready.

Most listed companies with a market capitalisation below €1bn are not covered by analysts or are only included in studies that paraphrase their publications. The rise of passive management[4] (around 20% of assets under management in Europe and 45% in the United States), which simply duplicates an index without basing its investment choices on financial analysis, is the primary reason. The Mifid II Directive, which came into force in Europe in 2018, by seriously reducing the quantity, or even quality, of research published on listed companies, has reinforced this trend. The share of transactions taken by high-frequency trading (HFT), which can exceed 50% of volumes, increases the suspicion that prices are disconnected from companies' actual performance.


Private market assets under management in 2019 (in $bn)
2,067
992
988
813
691
813
107
Total
6,471
3,450
1,405
1,309
306
100%
75%
50%
25%
0%
61%
25%
11%
3%
59%
27%
10%
4%
43%
10%
42%
5%
60%
30%
7%
3%
26%
8%
60%
6%
56%
25%
9%
10%
65%
5%
23%
7%
Buyout
Real Estate
Venture Capital
Private Debt
Growth
Infrastructure & natural resources
Others
Rest of world
Asia
Europe
North America

Source: Data from Company data, FactSet

While it seems to us to be completely unjustified to claim that stock markets are affected by short-termism, or that listed companies are affected by propagation of this defect,[5] the fact remains that:

Business life is often a succession of setbacks, of changes in strategy necessary for survival or of seizing opportunities. When you're listed, it's hard to escape a 10–20% drop in price in one day, which is not always justified. It's hard not to think that some people sell first and think later. While this decline will be corrected over time, managing the effect on employee morale is an extra task.

Governance of listed companies has improved significantly over the years[6] and is often of better quality than governance of family businesses, cooperatives or subsidiaries of groups. However, it is still often marked by complacency with independent directors chosen *de facto* and *de jure* by the majority shareholder or manager. There is not always sufficient debate and challenging of ideas. And poor governance sooner or later has consequences for the company's operations.

There are fewer and fewer shareholders with whom the managers of listed companies can discuss strategy and figures, since some shareholders simply duplicate a stock market index and others often delegate to agencies the task of studying meeting resolutions.

The stock market allows you to vote with your feet (by selling your securities) when you disagree with a strategy or with the execution thereof. But sometimes a manager or a team just has to be replaced and this often happens too late in the day when there aren't any strong voices on the board of directors or among the shareholders of a listed company.

A listed company may find it difficult to take on debt beyond the levels accepted on the stock exchange (say more than 3 times EBITDA), and it may not always be the right time for the desired capital increase. In short, the “easy” financing that comes with being listed may be somewhat theoretical.

To be listed is to be on a market and to be subject to its fluctuations (market risk), sometimes independently of a company's actual health.

3/ INVESTMENT FUNDS HAVE TAKEN CARE OF THEIR WEAK POINTS AND KEPT THEIR STRONG POINTS

In recent years, private equity funds have been working on their weak point: the illiquidity of their securities, which corresponds most closely to the maturity of their funds. This is a bit like squaring the circle, because how do you allow investors to exit a fund before it matures, while at the same time allowing the fund to have the time it needs to create value in its holdings by improving margins, digital transformation, acquisition and integration of competitors?

Faced with this need, unlisted funds have specialised in or have created funds specialising in secondary transactions (such as Ardian in Europe) to buy all or part of their shares from private equity investors before the normal maturity of the funds. This provides liquidity to those who need it, in amounts that are constantly increasing and that reached $87bn in 2020.

An investor in an unlisted fund can sell its shares in an LBO fund at a discount of less than 5% of the estimated value, about 10% for a fund invested in real estate and 15–20% for a venture capital fund with much more volatile assets. These levels are well below the discounts we see for listed conglomerates or investment companies.

At the same time, private equity funds have not let their guard down on their strong points:

They continue to have their own mode of governance[7] which constitutes a real competitive advantage. Unlike investors in listed companies, that hold very small minority stakes in scores (or even hundreds) of listed companies, whose managers they see only occasionally, private equity fund managers monitor only a few investments, which gives them a degree of understanding of these companies that facilitates intense and regular dialogue with their managers – fruitful discussions between informed people. The strategy is then better defined and controlled. In addition, management packages offered to the managers of the companies in which they invest, combine the carrot and the stick to align their interests with the progression of the company's value that they and their teams will create;

They continue to offer risk-adjusted rates of return, after manager compensation, that are on average at least equal to those of listed investments, with the best of them well above. For example, the French private equity industry reports an average rate of return after costs of 11.2% per annum over the last 15 years, and 9.9% over 30 years (i.e. an 18.7-fold increase in value);

They continue to be part of an average investment period of five years, which gives management time to implement a strategy, and if the horizon of the managers' business plans does not correspond to that of a private equity shareholder fund, it is not uncommon for the latter to sell its stake to another fund whose liquidation deadline falls after the end of the business plan.

4/ HOW DOES THE COMPANY POSITION ITSELF IN THIS MATCH BETWEEN LISTED AND UNLISTED COMPANIES?

Today, above a valuation range of around €10–15bn, only the stock market is likely to offer liquidity to investors who want to sell their shares. Admittedly, before 2008, LBOs were valued at around €30bn.[8] But that was before 2008, although they will most certainly be back.

It will take some time before private equity funds have the financial means to take an interest in the giants of the stock market, worth more than €50bn or €100bn and which represent the bulk of market capitalisation in value terms. And even if they had these means, current conditions do not suggest significant value creation, with a few exceptions. Most of these groups are currently well managed and difficult to consolidate among themselves, given the antitrust problems involved.

With a valuation below €10–15bn, everything becomes possible again. As an illustration, in 2019, KKR bought the free float of the German media group Axel Springer to take it off the stock market in a transaction that values it at €6.8bn, i.e. 40% above the stock market price. The same controlling shareholder and the same managers are thus moving from listed to unlisted. This example is far from an isolated one as we also have Ahlsell, Wessanen, Merlin, etc.

Under what conditions could such a small company stay and prosper on the stock market? We see several:

Run a **simple, easily understandable** business, with **rated peers** to facilitate comparisons and avoid discounts;

Avoid carrying **too much specific risk**;

Have a **free float of at least 30 to 40%**, because free float counts more on the stock market than market capitalisation;

Have **a story to tell investors (equity story)**, and tell it, whether it is one of growth like Cogelec, consolidation of a sector like Euronext, or dividend yield like Pearson;

Seek out several funds and favour a fragmented shareholding structure (the Stock Exchange) **in order to remain in charge of your own house**, rather than one fund investment, even a minority one, which leads to a certain amount of shared control.

Otherwise, we believe there is a high risk of a discounted valuation, which is not a short- or medium-term problem if control is retained and if there is no need for financing. Given the growing size of asset managers on the stock exchange, the largest of them (Blackrock) manages $7,300bn and the largest European (Amundi) €1,790bn, liquidity is concentrated on large caps with small and mid-caps being neglected. For the latter, valuation multiples are often significantly lower than for large stocks and the required rates of return are higher in view of a growing liquidity premium.[9]

At the same time, the regulatory constraints of listing are increasing without the cost/benefits balance tilting significantly towards the latter: IFRS standards on turnover and rentals, the MAR Directive, internal insider listings, etc. The aim is to protect investors, specifically private individuals, who are less and less frequently direct shareholders of listed companies (one third of listed companies' shareholders in the United States, around 10% in France). You have to be really motivated to stay listed when you're a small or medium-sized company, and you are not likely to carry out an ICO,[10] where, in order to attract buyers, the regulatory environment is very light, although not very consistent with the rest!

5/ IN THE END, A POROUS BORDER BETWEEN THE LISTED AND THE UNLISTED

We believe that listed and unlisted companies will continue to coexist in a complementary fashion, with private equity increasing its dominance in the segment up to around €10bn in value, and listed investment prevailing beyond that.

The boundary between these two modes of shareholding and governance is porous and we see a lot of toing and froing. Private equity firms have no qualms about selling companies on the stock market for which they no longer see any significant value-creation potential, especially if the stock market then generously values the companies, or those whose size is testing their limits. But private equity can also have its funds listed on the stock market and even hope one day to have them listed at a discount equal to or lower than that offered by secondary funds. A large listed investment fund controlling SMEs and second tier companies probably makes more sense to investors, and some companies, than a direct listing of the latter.

SUMMARY

The summary of this chapter can be downloaded from www.vernimmen.com.

Shareholder structure explains how power is distributed among a company's different shareholders or groups of shareholders. Major shareholder categories are as follows:

family shareholders. This model is in decline. New industries require too much capital for a family-owned structure to be viable. Funding requirements make capital markets become increasingly important;

business angels who invest at the most risky stage of a company: its creation or shortly afterwards;

investment funds (private equity) whether they are venture funds, LBO funds, capital development funds, etc.;

institutional shareholders (insurance companies, pension funds, unit trusts, etc.) who are becoming less passive;

employee-shareholders. Normally these shareholders are loyal and non-volatile, lending a degree of stability to the capital;

governments, the importance of which is rising due to sovereign wealth funds mainly originating from emerging markets.

Defensive measures for maintaining control of a company's capital carry a cost, because they prevent investors from taking advantage of the potential opportunities a takeover might create.

These measures include:

separating management control from financial control through double-voting shares, holding companies, limited share partnerships, investment certificates and non-voting shares;

controlling shareholder changes through right of approval clauses or pre-emption rights;

strengthening the position of loyal shareholders by carrying out reserved capital increases, buying back shares, merging, encouraging employees to become shareholders and issuing warrants;

exploiting legal and regulatory opportunities: specific regulations, voting right limitations and poison pills.

The best protection against a change of control is a good operating performance and a high share price which make shareholders happy and loyal.

In recent years, the decline in the number of listed companies and the increase in the number of companies controlled by investment funds has reflected the increased competitive advantage of these funds due to their intrinsic characteristics (governance, profitability, time horizon), while the constraints on listed companies have continued to increase. As a result, below a value of €1bn, listing a company becomes very complicated. Above €10bn, investment funds find it more difficult to gain a footing for the moment.

QUESTIONS

1/What techniques can be used for choosing shareholders?

2/What sort of general meeting must be held to approve capital transactions?

3/What power does a shareholder with a blocking minority have?

4/How would compensating employees in stock run contrary to financial theory?

5/What advantages are there in buying 100% of the capital of a limited share partnership?

6/A company manager has a 55% stake in his unlisted company, in which a competitor also has a 32% stake. The former is keen to dilute the shareholding of the latter, without diluting his own stake at the same time. What should he do?

7/Why is the shareholding of a family-run business unstable in the long term? What is the likely future of such a business? How can this process be slowed down?

8/Two managers have a 25% and a 75% stake respectively in a company. They are keen to bring in a capital investor with the minimum dilution to their shareholdings. How should they go about solving this problem?

9/Can business angels accompany the company in its development phase?

10/What is the best protection against an unwanted change of control?

11/Are investment funds and stock exchange listings antagonistic?

More questions are waiting for you at www.vernimmen.com.

EXERCISE

1/Provide a description of the shareholdings and management in the following situations:

Company 1: capital split between investors each holding the blocking minority.

Company 2: large group holding absolute majority, rest widely held.

Company 3: no shareholder has more than 5% of shareholders' equity.

Company 4: a competitor with blocking minority, a financial investor with shareholding significant but below blocking minority, rest widely held.

Company 5: trade buyer just below simple majority, rest widely held.

ANSWERS

Questions

1/*Approval, pre-emption, A and B shares, etc.*

2/*EGM (where applicable) as articles of association have to be altered.*

3/*Blocking decisions at EGMs.*

4/*Their risks are then not diversified.*

5/*Very weak, as it does not give the power to choose/remove the top management. It makes it possible to put pressure on management, a communication battle then begins!*

6/*Reserved capital increase if some minority shareholders vote with him so as to get the EGM's approval, contribution of assets, etc.*

7/*The principle of portfolio diversification renders the principle of a family shareholding structure unstable. It will be sold to pay taxes (wealth and inheritance taxes). Create a family holding company that can buy out the outgoing shareholders.*

8/*By creating a holding company or issuing convertible bonds.*

9/*No because, on the one hand, they often do not have the financial means and, on the other hand, when the company reaches this stage, they prefer to divest in order to reinvest in the start-ups which are their primary target.*

10/*Have excellent management and valuation that discourages temptations because it would be difficult to do better.*

11/*They compete for companies worth less than €10bn, which may be listed for a while, then pass into the hands of several investment funds before eventually returning to the stock market.*

Exercise

1/*Stable shareholding structure – Companies 2 and 5.*

Unstable shareholding structure – Companies 1, 4 and 3.

Managers: 1 – highly controlled; 2 – stable; 3 – only risk is risk of a takeover bid; 4 – stable (but risk of takeover bid could exist, if the financial investor sells to the competitor); 5 – stable (risk of takeover bid not excluded, to take private the company).

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NOTES

1 *See Section 45.3.*

2 *Enron's and Lehman's employees can confirm this!*

3 *See Section 46.2.*

4 *See Section 18.9.*

5 *See, for example, Kaplan (2018).*

6 *See Chapter 43.*

7 *See Section 47.3.*

8 *See Section 47.2.*

9 *See Section 19.4.*

10 *See Section 25.3.*

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Chapter 42
CHOOSING A CORPORATE STRUCTURE

There is nothing immutable or fixed about the organisation of a company. It is capable of adapting to changes in corporate strategy, access to financial resources, and market developments and moods, as well as any ambitions of its controlling shareholders. By way of example, the Schneider Electric group of today focused entirely on energy management and automation, and with 100% control of almost all its subsidiaries worldwide, no longer has anything in common with the Schneider of the early 1980s which was active in the steel industry, the nuclear industry, mechanics, textiles, watchmaking, electricity, and construction to name a few. Most importantly, the old Schneider Electric group (at the time heavily in debt) didn't always have control of these companies and was itself controlled via a myriad of holding companies, indirectly owned by the Schneider family.

Generally speaking, investors like simplicity and transparency, which allows for better understanding and easier valuation, whilst simplifying everyone's life and reducing risk (Schneider today). But markets are pragmatic and they can accept complex structures if growth and profitability are present (Alibaba, Liberty Media, Bollore).

A word of caution to our readers: whilst complex structures might solve certain problems or allow for certain opportunities to be seized, they are rarely without additional costs in the form of discounts and undervaluations. Sooner or later, they will have to be reviewed, corrected, and often broken into pieces, especially if the group is listed.

Section 42.1 ORGANISING A DIVERSIFIED COMPANY

The answer to this question depends first of all on the level of sophistication of financial markets. In a debt-ridden economy, financial markets are poorly developed, and it is difficult to finance new activities because equity is scarce. In such economies, it is frequently well-established groups that replace the financial markets; indeed, thanks to their self-financing capabilities, they can finance new activities internally. This can be seen currently in India with Reliance (petrochemicals, media, telecom, health, finance, construction, etc.), in Algeria with Cevital (food processing, supermarkets, electronics and appliances, steel, glass, construction, automotive, services, media) or in Colombia with Argos (cement, insurance, food processing, etc.).

Certain groups from emerging countries resolve the problem of under-sizing and inefficiency in the local equity capital market by going public in Europe or the United States. But this is only possible for the largest and most international companies (such as the Indian Vedanta or the Russian Evraz groups).

When a country moves from a debt-based economy to a financial market economy, the view on diversification of a company's activities changes: lenders are in favour of it because the diversification of a company's activities reduces its specific risk and therefore the lenders' risk.

Equity investors are naturally more sceptical: they know that specific risk is not remunerated (see Section 19.1), reducing it would not be beneficial either, and that there are no financial synergies. Diversification therefore creates value only if the company can use its operational know-how to gain a competitive advantage in a new business, thereby generating synergies. Unfortunately, practice has shown that alongside some brilliant successes – Amazon becoming a web services host (AWS) or Bouygues succeeding in telecoms – there are countless value-destroying failures: Allianz in banking (Dresdner), Murdoch in social networks (MySpace), etc.

If diversification fails, the company will be under pressure to turn the page by selling the division in question (L'Oréal and The Body Shop in 2017). If diversification is successful, the listed company may be perceived as a

conglomerate, with the risk of a discount appearing. We see, more often than not, that the market value of a listed conglomerate is lower than the sum of the values of the assets that make it up; the difference represents the conglomerate discount.

The discount generally reflects investors' fears that resources will be poorly allocated. In other words, the group might support ailing divisions beyond what might be reasonable and in which profitability is mediocre or below their cost of capital, and consequently underinvest in the most promising sectors. Moreover, investors are now keen on “pure play” stocks and prefer to diversify their holdings themselves. Finally, there is the problem of head office costs, which absorb part of the value of the conglomerate.

When a discount persists, and to avoid a hostile takeover bid, four solutions are available:

Convince the market of the synergies the diversified strategy creates.

Split up the company (demerger by spinning-off an asset, distributing the new shares to existing shareholders of the conglomerate, and listing the new asset[1]).

Piece by piece sale.

Demonstrate value by listing a portion of the capital of the undervalued division (Qualtics listed by SAP two years after its acquisition and valued at three times the acquisition price).

There is a very small number of conglomerates that are valued without a discount (Berkshire Hathaway, Amazon) because investors are convinced that they are efficiently managed.

Successful diversification is often a precursor to a change in the group's line of business, even if it means selling the old business (from the electronics engineer Racal to the telecom group Vodafone), or splitting into two independent entities (FiatChrysler and Ferrari, Dow Dupont and Corteva), or even via a sale/merger, such as the pharmaceutical business of L'Oréal, which was merged with Sanofi.

For family companies, the question remains as to where the diversification takes place: at the level of the shareholders or the operating company.

The family shareholders may only diversify their assets if they can increase dividends from the operating company without penalising it (Quandt, Benetton families), or sell part of its shares without jeopardising family control (J. Ratcliffe).

Otherwise, the operating company will have to be diversified like Bouygues (construction, telecoms, television) to allow for both asset diversification and maintaining family control. However, this supposes that the family's control is strong enough to dissuade a hostile takeover bid if a conglomerate discount starts to appear. In our example, Bouygues is protected by its strong internal culture and poisons pills such as TF1 broadcasting rights, or Bouygues Télécom telephone licences.

For some families, diversification is a luxury their already reduced control does not allow (e.g. Volkswagen where the Piëch and Porsche families only control 31.3% of the shares through a 50% owned holding company).

Section 42.2 TO BE OR NOT TO BE LISTED

Whether or not to float a company on the stock exchange is a question that concerns, first and foremost, the **shareholders** rather than the company. But technically, it is the company that requests a listing on the stock exchange.

> An initial public offering (IPO) is always to the advantage of the minority shareholders.

When a company is listed, its shareholders' investments become more **liquid**, but the difference for shareholders between a listed company and a non-listed company is not always that significant. Companies listed on the market gain liquidity at the time of the listing, since a significant part of the equity is floated. But thereafter, for small or medium-sized companies, only a few dozen or hundred shares are usually traded every day, unless the market “falls in love” with the company and a long-term relationship begins.

In addition to real or potential liquidity, a stock market listing gives the minority shareholder a level of protection that no shareholders' agreement can provide. The company must publish certain information; the market also expects a consistent dividend policy. If the majority shareholders sell their stake, the rights of minority shareholders are protected (see Section 45.3).

Conversely, a listing complicates life for the majority shareholder. It is true that liquidity gives them the opportunity to sell some of their shares in the market without losing control of the company. Listing can also allow the majority shareholder to get rid of a bothersome or restless minority shareholder by providing a forum for the minority shareholders to sell their shares in an orderly manner, or if they are simply looking for an exit. But in return, a majority shareholder will no longer be able to ignore financial parameters such as P/E multiples, EPS, dividends per share, etc. (see Chapter 22) when determining strategy. Researchers[2] have shown that listed companies invest less than unlisted companies and are less responsive to investment opportunities because of the short-sightedness of their shareholders.

Once a majority shareholder has taken the company public, investors will judge the company on its ability to create value and communicate financial information properly. Delisting a company to take it private again is a long drawn-out process (see Section 44.6). So, for management, being listed results in a lot more restrictions in terms of transparency and communication.

For the company, a stock market listing presents several advantages:

the company becomes widely known to other stakeholders (customers, suppliers, etc.). If the company communicates well, the listing constitutes a superb form of “free” advertising, on an international scale;

the company can tap the financial markets for additional funding and acquire other companies, using its shares as currency. This constitutes invaluable flexibility for the company;

the company finds it easier to involve employees in the success of the company, incentivising them through stock options, stock-based bonuses, etc.

in a group, a parent company can obtain a market value for a subsidiary by listing it (we will then speak of a carve-out) in the hope that the value will be high enough to have a positive impact on the value of the parent company's shares;

Listing on the stock exchange thus increases the company's financial flexibility, but this comes at the price of implementing stringent governance measures and adopting IFRS standards, all of which is costly and difficult to fully assess prior to making a decision.

Now for the warning flags: a stock market listing does not guarantee happy shareholders. If only a small percentage of the shares are traded, or if total market capitalisation is low, i.e. less than €1bn, large institutional investors will not be interested, especially if the company is not included in a benchmark index. Volatility on the shares will be relatively high because the presence of just a few buyers (or sellers) will easily drive up (down) the share price significantly.

Section 42.3 HAVING MINORITY SHAREHOLDERS IN SUBSIDIARIES?

It is simpler for a group to own 100% of the subsidiaries it controls outright. In this case, decisions can be taken without the consultation (or even approval) of a third party, legal formalities are reduced, and the benefits of implementing an effective strategy accrue entirely to the sole shareholder group. Moreover, in this case, the management of liquidity within the group is simplified because the dividend payout is made without “leaks” represented by the dividends paid to minority shareholders; the implementation of intra-group loans does not pose a problem either.

1/ THE REASONS

Nevertheless, a group may sometimes bring in (retain) minority shareholders to the capital of some of its subsidiaries. The motivations for welcoming a financial minority shareholder or carrying out an IPO of a subsidiary are generally different from those for bringing in an industrial partner.

Indeed, the affiliation of subsidiaries to another group can generate industrial, commercial or other synergies; and when the benefits identified go beyond mere financial reasons, the sharing of capital can generate tangible benefits.

But all is not rosy since accepting that a subsidiary opens its capital to a partner or in the financial market can generate risks of conflicts of interest (intra-group or partner transfer pricing, level of risk-taking, remuneration of intellectual property, etc.).

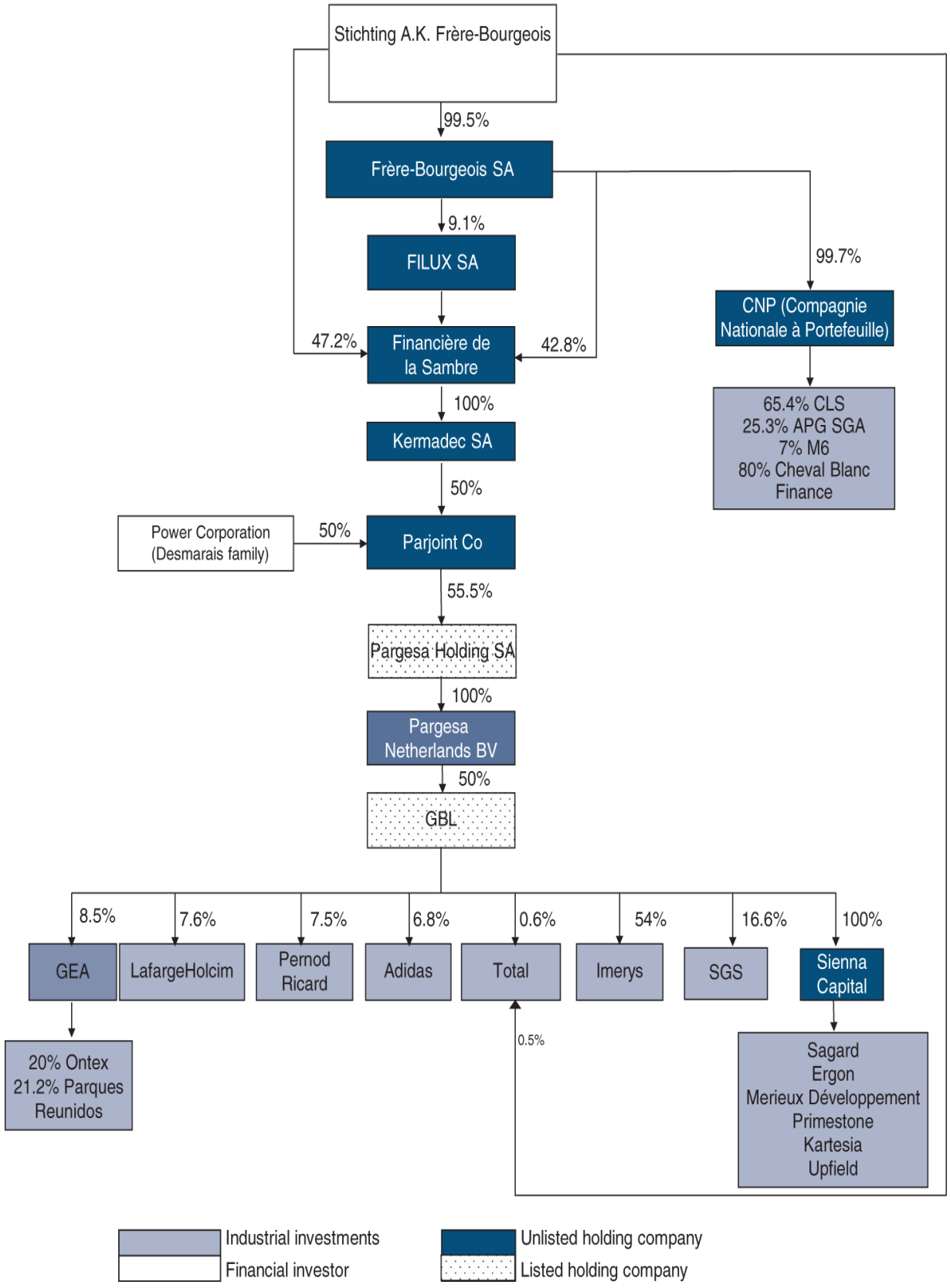
(a) Raising funds

Opening up the capital of a subsidiary can enable the group to raise equity capital in an attractive way, especially when it is difficult to find new equity at the level of the parent company. For example, AB Inbev IPOed its Asian subsidiary Budweiser Brewing Company APAC and got $5bn to pay down debts in 2019. Cooperative or mutualist groups may also list a subsidiary to raise equity capital they would struggle to get otherwise.

Groups can also use it to finance an acquisition without carrying out a capital increase (Schneider and a division of Larsen & Toubro). The buyer can also use a vendor loan to acquire the entire capital, or ask the selling shareholder to retain a share of the capital.

Finally, it is a preferred means of growth for family groups whose controlling shareholder does not have the financial means to achieve its strategic ambitions. The result is an organisation chart similar to that of the Frère group in Belgium:

Simplified organigram of the Frère-Bourgeois Group



Source: Data from Annual reports

The game consists of finding minority partners (at the different levels of the structure) during the growth phase; then, once the waterfall of subsidiaries have reached maturity and the cash flows have become more consequent, offer them an exit and close the structures.

(b) Externalise the value of an asset and facilitate external growth

Groups sometimes hold particularly prized assets in their midst, whose valuation multiple may be disproportionate to that of the group as a whole. This high valuation is due to the significant anticipated growth of a given activity.

In such a situation, the group may be undervalued if the size and shape of this attractive subsidiary is not properly understood by investors. The simplest way to revalue the entire group is to sell a share of the crown jewels, thereby externalising the value of this nugget.

Moreover, in such a case, it is value destructive for the group to raise equity at the parent company level to finance the subsidiary's development. This amounts to issuing undervalued shares (those of the parent company) to purchase assets valued at a normal price. It is better to be able to pay in shares of the subsidiary, which is as fairly valued as the target. In 2019, this is what led Volkswagen to open up the capital of its truck subsidiary Traton, in which it retained an 88% stake, to facilitate seizing external growth opportunities (Navistar in 2020).

(c) Sharing significant risk

A controlling shareholder may not want to endanger their group when undertaking an important and risky project. They may then agree to share the profits of the project to relieve themselves of some of the risk. Thus, when the Drahi group expanded into the USA in 2015 by taking over cable operators Cablevision and Suddenlink for $26.8bn, it shared the investment with BC Partner and CPP Investment, which combined held 30% of the capital, before listing it on the stock market in 2017.

(d) Reducing the contribution of a subsidiary to the earnings of the group

Without wishing to proceed with an outright sale, a group may decide to reduce its exposure to any one of its assets by selling a fraction of its capital to third parties. Vivendi sold 20% of the capital of UMG in 2019 and 2020, keeping temporarily 80%.

(e) Preparing for a future divestment

Minority shareholders entering the capital, or better still, initiating an IPO as discussed in the previous paragraph, also makes it possible to impose greater management rigour and specific governance requirements intended for listed companies. This can therefore be a first step towards a divestment by the majority shareholder and independence for the subsidiary.

The listing of a 28% stake in AXA Equitable holdings in 2018 was clearly presented by AXA as a first step towards a complete divestment. This plan was pursued in 2019 with several share sales eventually bringing AXA's stake in its former US subsidiary bank to below 10%.

(f) Relying on a partner with industrial knowledge or geographic advantages

Accepting an industrial minority partner requires considering multiple facets of the partnership. The partner may contribute more than just capital; it will generally be selected for its ability to contribute to creating value in the subsidiary by facilitating its integration into the economy, improving relations with local authorities, obtaining market share and driving synergies, for example in distribution. The Richemont group purchased 30% of Kering's eyewear division, which Kering had spent years developing to improve the quality of its Gucci eyewear products. Richemont then gave this division the supply contract for Cartier's eyewear products.

In a number of countries (China, Indonesia, United Arab Emirates, etc.) and sectors, the creation of wholly owned local subsidiaries is not always possible and a local partner is required, even if it is just a nominee shareholder. To develop its fuel cells business in China, Bosch chose to form a JV with Qingling Motors in 2021

When a local stock exchange exists, authorities can be very sensitive to the local subsidiary being listed (Nexans in Morocco, Nestlé in Côte d'Ivoire, etc.).

(g) Having a tool for motivating employees

Traditional motivational tools for employees in general and management in particular are mostly based on share performance (free shares, performance shares, stock options). In a large group, the specific performance of a subsidiary's management may be quite largely diluted in the overall performance of the group (e.g. DWS within Deutsche Bank, its asset management arm). The managers of a fast-growing business may then have the impression that they are not being properly compensated when receiving shares in the parent company.

2/ THE HOLDING COMPANY DISCOUNT

By multiplying the number of minority partners and subsidiaries listed on the stock exchange, the group runs the risk of losing its clarity and legibility for analysts and investors, of being assimilated to a holding company and then suffering a holding company discount, which is naturally to be avoided as it leads to a destruction of value due to the group's structure.

A holding company is a company that owns minority or majority investments in listed or unlisted companies either for purely financial reasons or for the purpose of control. Berkshire Hathaway, Siemens and Exor are examples.

A holding company trades at a discount when its market capitalisation is less than the sum of the investments it holds. For example, a holding company holds assets worth 100, but it only has a market capitalisation of 80. The size of the discount varies with prevailing stock market conditions. In bull markets, holding company discounts tend to contract, while in bear markets they can widen to more than 30%.

Here are four reasons for this phenomenon:

the portfolio of assets of the holding company is imposed on investors who cannot choose it;

the free float of the holding company is usually smaller than that of the companies in which it is invested, making the holding company's shares less liquid;

administrative inefficiencies: the holding company has its own management costs which, discounted over a long period, constitute a liability to be subtracted from the value of the investments it holds. Imagine a holding company valued at €2bn with administrative costs of €10m p.a. If those costs are projected to infinity and discounted at 8% p.a., their present value is €125m, or 6.25% of the value of the holding company.

tax inefficiencies: capital gains on the shares held by the holding company may be taxed twice – first at the holding company level, then at the level of the shareholders. In most countries, but not all, sales of a large stake (above 5%) are often taxed at a low rate to avoid double taxation.

These factors can generally explain a statistical discount up to the 15–25% range. Beyond that, the discount is probably more indicative of a power struggle between investors and holding companies. The former wanting to get rid of the latter and finance the operating assets directly.

3/ THE EVOLUTION OF THE SHARE STRUCTURE OVER TIME

Any partnership must find its balance. Since the minority position is not the easiest to be in, it is often the case that minority shareholders will sooner or later seek an exit.

For “industrial” minority shareholders, their contribution dwindles over time and their disinterest eventually results in a *de facto* subsidiary wholly controlled and run by the majority group. Sometimes a minority shareholder will adopt counterproductive behaviour to force the majority shareholder to offer it an exit if one has not been contractually provided for.

For a financial partner, the need for an eventual exit is obvious. Most of the time, they will require a form of liquidity that is contractualised *a priori* in a shareholders' agreement: a put option, a commitment to go public or to perform a joint sale, etc.

Section 42.4 JOINT VENTURES

Most technological or industrial alliances take place through **joint ventures**, often held 50/50, or through joint partnerships that perform services at cost for the benefit of their shareholders. For example, General Electric and Safran created CFM International in 1972 to produce the CFM56 aircraft engine, and have together become the world leaders in the sector.

Several benefits can be identified: economies of scale, complementary experiences, learning, protection from larger competitors, creating a strategic future opportunity.

The shining example of CFM should not mislead our reader. Most joint ventures are sooner or later unwound, because the reasons that justified their creation and pushed groups to join together on an equal footing disappear over the course of time. Dissolution is then the best solution to avoid boardroom paralysis. Either the joint venture is doing well and one of the shareholders will want to take control of it, or it is doing badly and one of the shareholders will want to get out of it (or will at least refuse to bail out the losses and will therefore be gradually diluted). Thus, in 2019, the Stellantis group (Peugeot-Fiat) bought out the shares of its Chinese partner Changan in the joint venture manufacturing and marketing DS in China. Sales were disappointing and the partners no longer had the same outlook on the brand's potential. Preparing for the potential future exit of one partner is key when creating a joint venture. Joint venture agreements often have **exit clauses** intended to resolve conflicts. Some examples are:

put and call clauses. These are used in particular if one of the shareholders is likely to be a long-term shareholder (industrial) and the other less long term (financial). The exercise price of the option can either be predetermined, be based on a formula or be determined by an expert independent of the shareholders. The joint venture that Valeo and Siemens created in 2016 foresees a call and a put in 2022, suggesting a potential 100% takeover by Valeo.

a buy–sell exit provision, also called a **Dutch clause** or a **shotgun clause**. For example, shareholder A offers to sell their shares at price *X* to shareholder B. Either B agrees to buy the shares at price *X* or, if they refuse, they must offer their stake to A at the same price *X*.

Section 42.5 BEING IN THE MINORITY

Although the vocation of a group is not to be a minority shareholder, there are nevertheless several situations where groups hold minority interests. There are several possible reasons for this:

the group wants to gain a **foothold in a new activity**, and starts by taking a minority stake in a company, even if it later takes control once the business model is refined. This is what groups are doing today with digital start-ups (Facebook in Unacademy, Daimler in ChargePoint, etc.);

the group wants to **“lock in” an asset** by taking a stake in a company it wants to eventually take control of (Vivendi in Lagardère, eyeing its Hachette subsidiary). It consequently gets a foot in the door;

a legal provision prohibiting in certain sectors of activity holding more than a certain percentage (49% for a television channel in France, for example); Certain countries (such as Algeria or Indonesia) do not allow a foreign group to be a majority owner of a local company;

the relative value of the contributions when setting up a joint venture did not allow the group to obtain at least 50%. Thus Diageo holds 34% of the spirits subsidiary Moët Hennessy alongside LVMH at 66%;

to seal a strategic or operational partnership between groups through the acquisition or exchange of minority shareholdings in order to give it greater weight. For example, since 2018, Tencent has owned 5% of Ubisoft, whose products it distributes in China;

because it is the **remnant of a business being divested**. Thus L'Oréal owns 9.2% of Sanofi, which is the successor to its 100% ownership of Synthélabo, which has been reduced over time by mergers and sales;

because a **minority can lead to or determine the control of** a group with a very fragmented shareholder base (Mediobanca in Generali) or in the case of a limited partnership (for example, for certain specialist real estate companies, the status of general manager offers a varying degree of control).

From a financial point of view, these minority shareholdings are seldom properly valued. When they are below the equity method threshold (*a priori* 20%, see Section 6.1), they may be completely forgotten by investors,

especially if they do not pay dividends, if their historical cost price is low, or if their strategy is not explained clearly to investors.

The equity method of consolidation is not the holy grail, since the share of profit or loss accounted for by the equity method is not included in EBITDA, nor EBIT or free cash flow, which are aggregates frequently used for valuation purposes (Chapter 31) and in the analysis of indebtedness (Chapter 12). This is in addition to the acquisition of the shareholding reducing the company's liquidity. Hence the deterioration in value if analysts do not do their job properly. To avoid this problem, it is in the company's best interest to include the profits accounted for using the equity method in the operating profit as permitted by IFRS.

Our reader will note the asymmetry with the situation where the company disposes of a minority interest in one of its subsidiaries. Operating income and EBITDA are unchanged, but the company's net debt has been reduced thanks to the cash received, which has a positive impact on the value of the company and its financial situation for those who run their calculations too quickly.

In any case, the value of a minority shareholding will be better protected if a shareholders' agreement is signed with the majority shareholder and if the minority company is represented on the board.

Section 42.6 THE FINANCIAL STRUCTURE WITHIN THE GROUP

In arranging financing, the CFO must first determine where to situate the net debt within the group, and then which entities will use external financing and which entities will be financed by intra-group loans. These are two separate decisions because a group entity that indebts itself may well have zero net debt if it then lends to other group entities.

With regard to positioning the net debt, it is a good principle of financial management and internal governance to ensure that the surplus cash of subsidiaries systematically flows back to the parent company at least once a year. In this way, it can allocate financial resources between the different units in the best interests of the group, create or acquire new ones, and avoid the formation of internal baronies (based on the principle that the one who has the money has the power). It is therefore not advisable to locate the net debt within the parent company, leading to a poor parent and rich children.

The choice of the internal financing structure will depend on various parameters:

Tax aspects that consist of four main variables: the tax rate on profits in the country where they are generated, the tax cost of paying dividends (taxes and withholding taxes) in that country, the tax cost of collecting dividends in the receiving country, and finally the social acceptability of possibly having structures in countries considered as tax havens. Thus, for an American group, until 2017, it was expensive to repatriate dividends from countries where the corporate tax rate was lower than the federal rate of 35%, because it had to pay an additional tax to the Treasury for the difference. This is why Apple's subsidiary in Ireland (official corporate tax rate of 12.5%) was so cash-rich and Apple Inc. so indebted! Several countries have put into place tax measures to limit intra-group indebtedness of subsidiaries (earning stripping rules in the US, thin capitalisation rules in the UK).

This will allow cash to accumulate in subsidiaries, thus imposing some form of internal financial structure on the CFO.

Legal constraints: These can, particularly currency exchange constraints, handicap the upward flow of liquidity from subsidiaries, forcing the development of wealthy subsidiaries within a group. As an example, even though no law or regulation stops the outflow of capital in China, the financial system (banks in particular) does so when asked by the government. Local subsidiaries are therefore obliged to keep their cash or invest it locally. Thus, since it is generally easier to send interest and loan repayments upwards than dividends, in a constrained legal environment internal debt is preferred.

The geography of the assets: if the assets are to be used as collateral for financing (see Section 39.1), the debt capacity will naturally depend on the legal ownership of the assets. The group will then indebt its operating subsidiaries (or possibly the holding companies holding listed securities, if any).

The motivation of local management: adopting LBO logic, the group's management may wish its subsidiaries to be in debt as a matter of principle in order to create a "healthy pressure" for their management to generate cash flows at least sufficient to service the debt. This motivation will be all the more important as the debt will be owed to third parties. It is always possible to make arrangements with the parent company in the event of a default on an inter-company loan, but it is more complicated to do so with one's bankers.

The presence of minority shareholders: it is often simpler to finance subsidiaries in which there are minority shareholders with external debt. Indeed, intra-group financing by debt in proportion to ownership percentages is complicated to implement, while financing solely by the majority shareholder raises the question of the interest rate to be charged in the context of normal governance.

The simplicity of a group's financial structure generally goes hand in hand with its maturity. Most large groups are financed almost exclusively by bond debt issued by the parent company (Section 39.1), which then finances its subsidiaries through intra-group loans. Bond investors prefer to lend to the highest level of the group, which has access to all the cash flows, since they do not, at least for investment grade issuances, have any security on its assets.

Conversely, SMEs that use bank financing are more likely to use the assets of subsidiaries (receivables, inventories or even real estate assets) to secure lenders and thus obtain more attractive terms: factoring, securitisation of receivables and inventory, leasing of fixed assets.

The quality of the signature also plays an important role in the choices made by the CFO. The more financially sound the group is, the less it needs to secure its financing with assets, allowing the financing to be carried out at the level of the parent company. This makes steering easier for the central finance department.

The more financially strained groups use all available means to obtain financing and therefore use their liquid assets, generally located in the subsidiaries, as much as possible. Although this will make it more complex to monitor financing, the financial directors of subsidiaries have broader and often more motivating roles. At this level, an important and structural decision is whether or not to place non-recourse (on the group's cash flows) financing with subsidiaries.

If third party indebtedness at the subsidiary level is high, lenders at the parent company level will see a specific risk that the rating agencies will also take into account. The subsidiaries' lenders will have direct access to the assets in the event of liquidation whilst the parent company's lenders will be naturally subordinated. They will only be able to recover a share of the value of these assets after the subsidiaries' lenders have fully recovered their debts. This is structural subordination that worsens rapidly as the risk of bankruptcy increases.

But the CFO's job does not stop there. Once they have conceived and set up this financial structure within the group, they will have to bring it to life. This means supplementing it with intra-group loans to supply units that do not have sufficient external financing. But also to determine the desirable and achievable dividend payouts from a financial, legal and tax point of view. The intra-group financial structure will live and evolve in line with the subsidiaries' cash flow generation and the upwards flow of dividend payments.

Section 42.7 THE LEGAL STRUCTURE WITHIN THE GROUP

1/ TAX INFLUENCE

The hot topic in today's global environment is transfer pricing. As a result of globalisation, it has become extremely rare for a product or service to be designed, manufactured and distributed in a single country, with components coming only from that country. More often than not, a product or service is designed in one country, manufactured in another country, often with components from several countries, and then distributed in a multitude of countries. Hence the ability, thanks to transfer pricing, to locate in any given country (the one with the least burdensome tax regime) the bulk of the value created.

Management fees, trademark and patent licences are other tools used to support this tax strategy for group organisation.

Countries which have seen their tax bases shrink as a result of these practices, have tracked down the most obvious abuses (predominantly the GAFAM), and now require precise, detailed and convincing documentation from any company to justify these schemes and the pricing used.

Schemes aimed at evading part of the tax burden, even perfectly legal ones, are less and less tolerated by citizens and are more and more frequently singled out, which is not without negative consequences to a company's image and business (see Apple, McDonald's, Google).

> This is a long-term trend that seems all the more healthy to us since corporate tax rates have fallen significantly worldwide over the last thirty years, depriving tax optimisation from its initial justification. The implementation of a minimum 15% tax rate worldwide should be an additional limit to the tax optimised structure going forward.

Optimising transfer pricing or the ownership location of intellectual property for trademark or patent royalties is not just a legal and fiscal choice. It requires a real operational change that commits the group to a long-term strategy (even though tax rules may change).

Beyond the tax aspects, these cash flows have the advantage for the majority shareholders not to be earned by the minority shareholders. Thus, it was financially far more effective for Disney to receive management fees from Euro Disney rather than to receive its share of dividends.

To conclude this subject, our reader should be aware that tax optimisation often goes against the very notion of simplicity, and that it is sometimes very complex and costly to unravel a structure set up for tax reasons.

We know of more than one group that has failed to dispose of a business for this reason or has done so with great difficulty.

2/ GEOGRAPHIC OR BUSINESS LINES HOLDINGS?

A group with several types of businesses may consider whether it is better to organise itself legally by having one holding company per country or geographical area, grouping together the companies carrying out each of the group's businesses in the country or area; or whether it is better to set up vertical internal holding companies for each business, grouping together all the companies carrying out that business worldwide.

The first type of organisation is probably the one that maximises synergies within a group, since these are usually primarily geographical: purchasing power from national suppliers, shared administrative services, etc.

The second type of organisation makes it easier for minority shareholders to enter a given business unit, or even to take it public or sell it, which is more complicated to carry out under a geographical organisation. On the other hand, it is probably more costly, as it makes it more difficult to achieve internal synergies.

SUMMARY

The summary of this chapter can be downloaded from www.vernimmen.com.

The organisation of a group evolves over time according to its strategy and constraints. If simplicity and legibility are the key to an accurate valuation, it may happen that the group strays from this line for a more or less lengthy period of time.

Diversification of activities is more frequent in groups controlled by a single shareholder, who thus reduces their risk, than for a listed company without a controlling shareholder, for which there is strong pressure from investors to avoid diversifying, as they have little appreciation for diversification that they can achieve themselves on their own terms. Failing this, the holding discount is the penalty.

A stock market listing allows shareholders to achieve a certain liquidity for their investment in the company. However, this liquidity is only real for large companies or only at the time of the IPO for smaller companies. For the company, an IPO provides access to new sources of financing, enhances its reputation and can create financial interest for its managers and employees in the improvement of its value. However, it implies having a strategy linked to financial parameters.

Opening up the capital of subsidiaries to minority shareholders provides leverage to raise funds, enables the value of an asset to be externalised and whilst facilitating external growth, can prepare for a phased divestment, reduces the weighting of an asset in the group's results, allows the subsidiary to take more risks, gain a partner offering synergies, and motivates the subsidiary's employees. If it is used too frequently, the company runs the risk of becoming a holding company with the discount that goes with it.

Being a minority shareholder in another company is most often an option for a non-financial group for future developments, even if from a financial point of view, these holdings are often poorly valued because they are not well known and identified by investors.

It is a good principle of financial management that the parent company of a group should be the one that takes on debt in order to lend to its

subsidiaries and that net debt at its level should be as low as possible in order to maintain financial flexibility.

For a long time, international groups have been structured to reduce the tax friction associated with dividends paid by subsidiaries. Transfer pricing, a means of shifting margins around within the group often based on tax considerations, has taken over in group structuring. It is now very much in the hot seat because manipulating it is increasingly poorly viewed by society and is now strictly controlled by governments.

QUESTIONS

1/What are the reasons for a company to IPO?

2/Which investors benefit from the diversification of a group? And who loses?

3/Is diversification more common in countries with debt or financial market economies? Why?

4/What is the advantage of a “Dutch clause”?

5/What can investors fear in a holding group?

6/Is having an industrial or financial minority shareholder the same thing?

7/Why do some conglomerates continue to exist, despite the value destruction they bring? Is this sustainable?

8/What is the advantage of cascading ownership structures for the majority shareholder? What about for everyone else?

9/What is the difference between the holding discount and the conglomerate discount?

10/Is a joint venture sustainable *ad vitam eternam*?

11/What protects the value of a minority stake held by a group?

12/How is the manipulation of transfer prices a solution to dividend control in some emerging countries?

13/Is the holding company discount a foregone conclusion?

14/Is a parent company with low net debt the opposite of a parent company that borrows on behalf of its subsidiaries?

15/What does a listed group often do with free cash flow that has become copious after years of lean years during which it has opened up the capital of its subsidiaries to minority shareholders?

16/What is the percentage interest of a shareholder in an asset that they own 51% of through four holding companies that all have 49% minority shareholders? Do you then better understand the expression “Working for peanuts”?

You'll find more questions at www.vernimmen.com.

EXERCISE

1/A company generates an annual cash flow of 200 that is no longer growing. Its cost of capital is 10%. Its value by discounting cash flows is therefore 200 / 10% = 2,000. But it turns out that this company is made up of two divisions, one of which generates a cash flow of 100 which grows by 5% per year and the other of 100 which decreases by 5% per year. Since both have the same cost of capital of 10%, the first division is worth 100 / (10% − 5%) = 2,000 and the second 100 / (10% + 5%) = 667. Analysed with this method, the company is worth 2,000 + 667 = 2,667.

All things considered, is it worth 2,000 or 2,667?

ANSWERS

Questions

1/*Access new sources of funding. Increase its visibility for its customers, suppliers, employees. Facilitate employee and management incentives. Offer liquidity to its shareholders (especially if there are minority shareholders).*

2/*Lenders because their risk is reduced. Shareholders, because a diversified group is more difficult to manage and is rarely more efficient than a single-business group.*

3/*In indebted economies with poorly developed financial markets, large groups are a substitute to financial markets.*

4/*Discouraging strategic differences between shareholders and, in the event of divorce, obtaining a fair price for both parties.*

5/*A misallocation of funds to the benefit of the worst performing divisions and to the detriment of the best.*

6/*No, the industrial investor can bring synergies but will quite possibly want to take control in the long term; the financial investor will sooner or later want to exit to show a profit.*

7/*Because of the incentives it provides its owners and management: power, prestige. No, because sooner or later the pressure from the shareholders will be felt.*

8/*Secure control with limited means. Choose the assets you want to be a shareholder of.*

9/*See Section 42.1 and 42.3.*

10/*Rarely. Either it succeeds, in which case one of the partners will want to buy the other's share so as to keep the profits for itself. Or it fails or plods along and one of the partners will want to exit to turn the page on the investment.*

11/*A shareholders' agreement with the majority shareholder, a position on the board of directors. Takeover regulations if the company is listed.*

12/*By transferring the transfer pricing margin out of the country, there is no longer any significant profit to be repatriated as a dividend.*

13/*Yes, because Warren Buffett's holding company is almost the only one to be quoted on exchanges at a premium to its revalued net assets.*

14/*No, because if it borrows to lend to its subsidiaries, the parent company's net debt may be low.*

15/*It buys out minority shareholders to increase its stake in its subsidiaries to 100%.*

16/*$(51\%)^5 = 3.5\%$. Each time the value of the asset increases by 100 thanks to their good management, they only get 3.5% richer. So they are working for the other investors more than for themselves!*

Exercise

1/*This problem is based on a fallacy, i.e. a false reasoning that has the appearance of truth.*

It is wrong to say that it is equivalent to having one company growing by 0% or two divisions of identical size growing by 5% and −5 %, even though it is true that 5% − 5% = 0%. Indeed, very quickly the two divisions will no longer generate the same free cash flow because of their diverging growth rates. For example, after five years, the flow of the first is 128 and that of the second 77. It will no longer be possible to say that the group's growth rate is the average between 5% and −5%, i.e. 0%. It will be the weighted average of 5% and −5%, but with different weightings from the initial 50% − 50%. Moreover, in the long term, the group's growth rate will converge towards 5%, since by constantly decreasing by 5% every year, the second division will eventually disappear: in year 50, its flow will be 8 against 1,147 for the first division. A few years later, only the first division will be left, which will become the group as a whole, and will therefore grow at 5%.

Therefore the discounted cash flow valuation of the group is 2,667 and not 2,000. But to do this, the CFO will need to do some pedagogical work by communicating on the performance of the two divisions, or by listing the first one on the stock exchange, or even splitting the group into two parts to avoid significant undervaluation (25% in our example).

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NOTES

1 *See Section 46.3.*

2 *Asker et al. (2015).*

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Chapter 43
CORPORATE GOVERNANCE

Or on being politically correct

Problems with corporate governance arise as a result of changes in the capital structure and organisation of companies. Corporate governance is not an issue for companies where the manager is the sole shareholder. But gradually the founding shareholder's stake will be diluted and corporate governance issues will arise between the majority shareholder, who is also usually the manager, and minority shareholders. When a company starts out as family owned and evolves into a company with a fragmented shareholding of institutional and retail investors, new problems of corporate governance will arise. These will relate to control that the shareholders have over the managers, who will have less freedom as a result of the fragmented shareholding structure.

Section 43.1 WHAT IS CORPORATE GOVERNANCE?

1/ DEFINITION

Broadly speaking, corporate governance is the organisation of the control over, and management of, a firm. It covers:

the definition of the legal framework of the firm: specifically, the organisation, the functioning, the rights and responsibilities of shareholders attending meetings and the corporate bodies responsible for oversight (board of directors or executive board and supervisory board);

the rules for appointing and remunerating managers and directors;

management rules and any conflicts of interest;

the organisation of control over the management and the running of the company: internal controls, regulatory controls, auditing;

the relations between managers and shareholders;

the rights and responsibilities of other stakeholders (lenders, customers, suppliers, employees);

the disclosure of financial information on the firm and the role and responsibility of external analysts: financial analysts, rating agencies and legal and financial advisors.

In a narrower definition, the term “corporate governance” is used to describe the link that exists between shareholders and management. From this point of view, developments in corporate governance mainly involve the role and functioning of boards of directors or supervisory boards.

We would suggest[1] that corporate governance covers all of the mechanisms and procedures surrounding decisions relating to the creation and sharing of value. They concern four main areas: shareholders' rights, transparency of information, organs of management and control and the alignment of compensation.

At this stage, we'd like to emphasise that corporate governance is a system that necessarily differs from one firm to the next, depending on its shareholding structure and its nationality. Strictly speaking, it is a bit of a misnomer to refer to “good” or “bad” corporate governance. There is only corporate governance that in practice inspires investors' confidence (or not) in the way in which decisions are taken within the firm, based on whether the following five principles are respected: efficiency, responsibility, transparency, fairness and ethics.

2/ RECOMMENDATIONS AND GUIDELINES

It should always be remembered that the organisation of corporate governance is determined, first and foremost, by company law, which defines the field of possibilities:

prerogatives of the market regulator;

listed companies' information obligations (shareholders' agreements, etc.);

vote by shareholders on managers' compensation;

composition of the board of directors (maximum number of directorships in public limited companies);

possibility of separating the function of chairman of the board of directors from that of CEO;

transparency with regard to conditions for preparing and organising the work of the board of directors and internal control procedures.

Over the years, a number of recommendations and guidelines have been added to the purely regulatory and legislative framework, in the form of reports and best practice codes (commissioned and/or drafted by employer bodies, investor associations, governments and government agencies, stock exchanges, etc. in various countries). It is important to note that these codes remain recommendations and guidelines only,[2] and are not legally binding laws or regulations.

The main recommendations and guidelines in terms of corporate governance all focus on key issues: transparency in the way that the board

and management operate, the role, composition and functioning of the board and the exercise of shareholder power at general meetings.

However, each country has its own category when it comes to companies and their shareholders:

employee rights in Germany (and also in Denmark, Austria and Sweden);

the role of banks and conglomerates in Japan and South Korea;

very widely held shareholdings in the UK or USA;

etc.

(a) Transparency

The first recommendation is for transparency in the way the company's management and supervisory bodies operate.

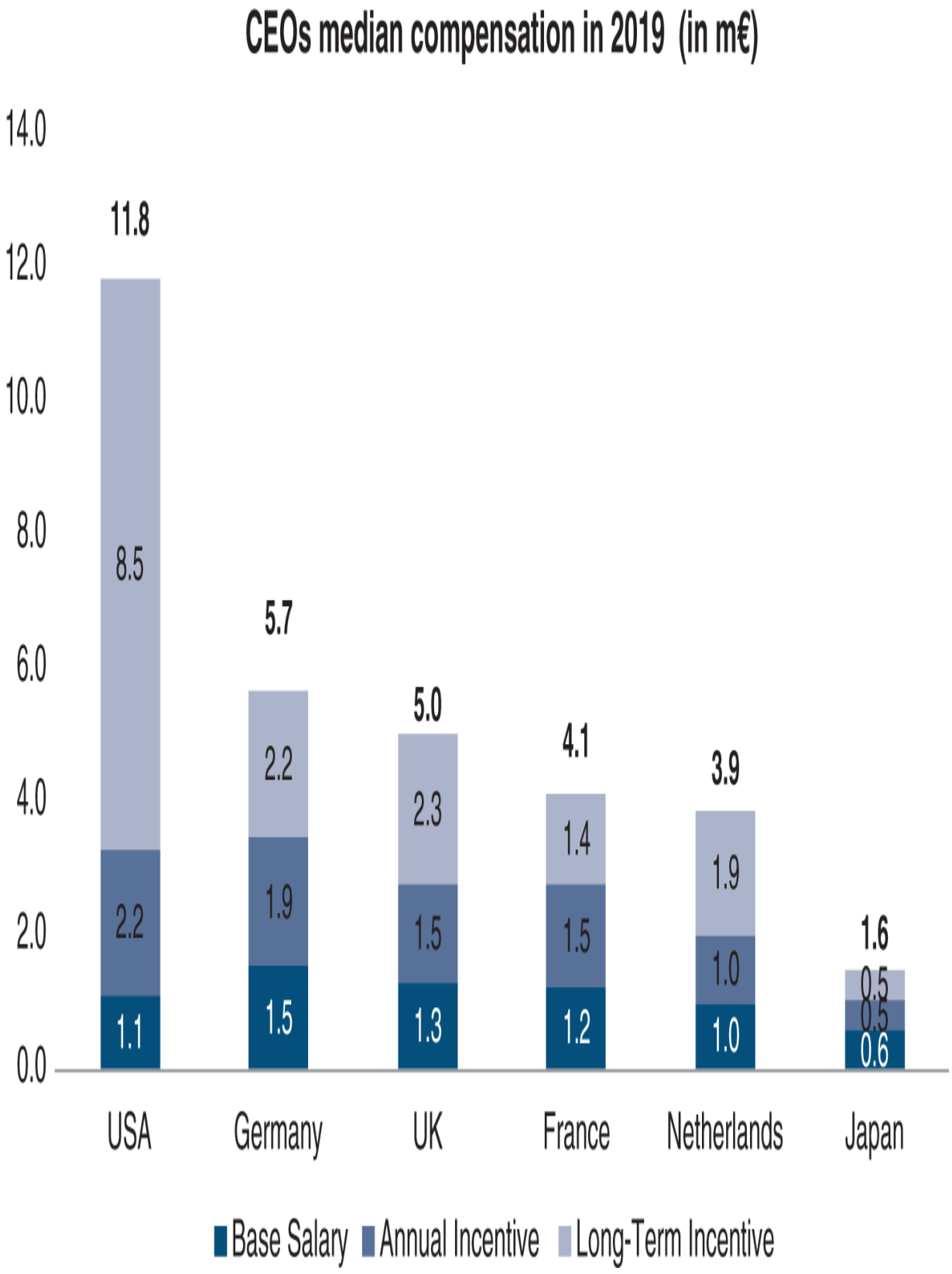
> There has been a huge increase in transparency in the way the boards of listed groups have operated over the last 20 years.

Transparency surrounding the compensation of managers and directors is also recommended. As we saw in Section 26.3, the way in which firms compensate management plays a key role in reducing conflict between shareholders and managers.

In some countries, shareholders vote on management compensation (say on pay). It is either a consultative vote (Germany, Spain, USA) or a binding one (France, Sweden, the Netherlands, Switzerland, UK).

With the granting of variable compensation or stock options, managers have a financial interest that coincides with that of shareholders, to whom they are accountable. Stock options are not, however, a cure-all, as the short-term vision they encourage may sometimes tempt management to conceal certain facts when disclosing financial information and, in extreme cases, they may even consider committing fraud. This has resulted in the development of alternative products, such as the granting of free shares, the payment of part of their compensation in shares, etc., or by tightening the conditions for exercising stock options and selling the underlying shares, and linking them to criteria that are not only financial, such as ESG criteria.

Between 60% (in Japan) and 90% (in the USA) of management compensation of large firms is linked to performance and share price.



Source: Willis Towers Watson, PWC

The principle of transparency also applies to transactions carried out by management in the shares of the company. These have to be made public due to the signals that they may give out.

Finally, in reaction to the payments made to managers who had failed (Technip FMC, Sanofi, UBS, etc.), which were, and rightly so, shocking in terms of both the amount and the principle, it is often recommended that these “golden parachutes” only be paid in the event of forced departure and linked to a change in control or strategy and for an amount that does not, in general, exceed one or two years' salary. Sometimes this compensation is subordinate to performance conditions.

(b) The role of an independent board

Corporate governance codes all recommend that a firm's corporate strategy be defined by a body (board of directors or supervisory board) which enjoys a certain degree of independence from management.

Independence is achieved by limiting the number of managers who sit on the board, and by setting a minimum number of independent directors.

For example, in the UK the latest recommendation is that at least half of the directors of listed companies should be independent. There are very few companies with no or hardly any independent directors on the board.

The definition of the term “independent director” is the subject of much controversy. As an example, the Bouton report defines an independent director as follows: “Directors are independent when they have no link of any nature whatsoever with the company, the group or management, which could compromise them in the exercise of their free will.” Even though this definition makes it clear that a member of management or a majority shareholder representative would not be considered independent, it allows for a great deal of leeway, which means that deciding whether or not a director is indeed independent is not as easy as it might appear.

The importance given to the need for independent directors on the board tends to overshadow the importance of other more vital matters, such as their competence, their availability and their courage when it comes to standing up to management. These qualities are indispensable throughout the financial year, whereas their independence only becomes an issue in

situations of conflict of interest, which fortunately are the exception rather than the rule.

The importance of independent directors is highlighted by the appointment of an independent director to the position of vice chairman of the board or lead independent director (Nike, GSK, Danone, etc.), especially when the roles of Chairman of the Board and Chief Executive Officer are fulfilled by the same individual.

The lead independent director plays a leadership role for the independent directors and has a little more power than the others. They may put up items for discussion on the board's agenda, call a meeting of the board members without the presence of senior management, or even, if they believe that the CEO is no longer up to the task, take steps to have the latter replaced. They are also often in charge of the dialogue with non-controlling shareholders on governance topics.

Lawyers will surely forgive us for pointing out that the development of corporate governance has brought an end to the idea of the board of directors as an entity invested with the widest of powers, authorised to act in all circumstances in the name of the company. This gives the impression that the board was responsible for running the company, which was quite simply never the case. This erroneous idea put management in a position where it was able to call all of the shots. These days, boards are designed to determine the direction the company will take and to oversee the implementation of corporate strategy. This is a much more modest mandate, but also a lot more realistic. The board is asked to come up with fewer but better goods.

(c) The functioning of the board and of directors' committees

Corporate governance codes insist on the creation of special committees that are instructed by the board to draw up reports. These committees generally include:

an audit committee (inspects the accounts, monitors the internal audit, selects the external auditors);

a compensation committee (managers, sometimes directors);

a selections or appointments committee (paves the way for the succession of the managing director and/or CEO, puts forward proposals for new directors);

a strategic and/or financial committee (large capex plans, mergers and acquisitions, financing issues);

a risk committee;

an ethics and/or governance and/or social responsibility committee.

(d) The exercise of shareholder power during general meetings

It is clear that anything that stands in the way of the exercise of shareholder power will be an obstacle to good corporate governance. Such obstacles can come in various forms:

the existence of shares with multiple voting rights that may enable minority shareholders with only a tiny stake in the capital to impose their views by wielding their extra voting rights (see Section 41.2);

the existence of preferred shares with no voting rights attached.[3] The control held by the Hoffmann family over the Swiss pharmaceutical group Roche is greatly facilitated by the existence of non-voting shares accounting for 81.5% of the share capital;

the restriction of voting rights in meetings by introducing caps on the number of votes cast during general meetings. For example, at Danone, a single investor cannot represent more than 6% or 12%[4] of the voting rights;[5]

administrative or material restrictions on exercising voting rights by proxy or by postal vote.

On the other side, making it compulsory for institutional shareholders to vote in general meetings of shareholders, or allowing shareholders to vote without having to freeze their shares a few weeks before the meeting, can clearly improve voting habits and enhance shareholder democracy.

The rise of securities lending may raise the issue of representativeness of general meetings. Shareholders who have lent their securities cannot vote at General Meetings, while still maintaining their economic exposure; the opposite is true for those who have borrowed securities. This is why

securities lending exceeding a percentage of voting rights must be declared in some countries.

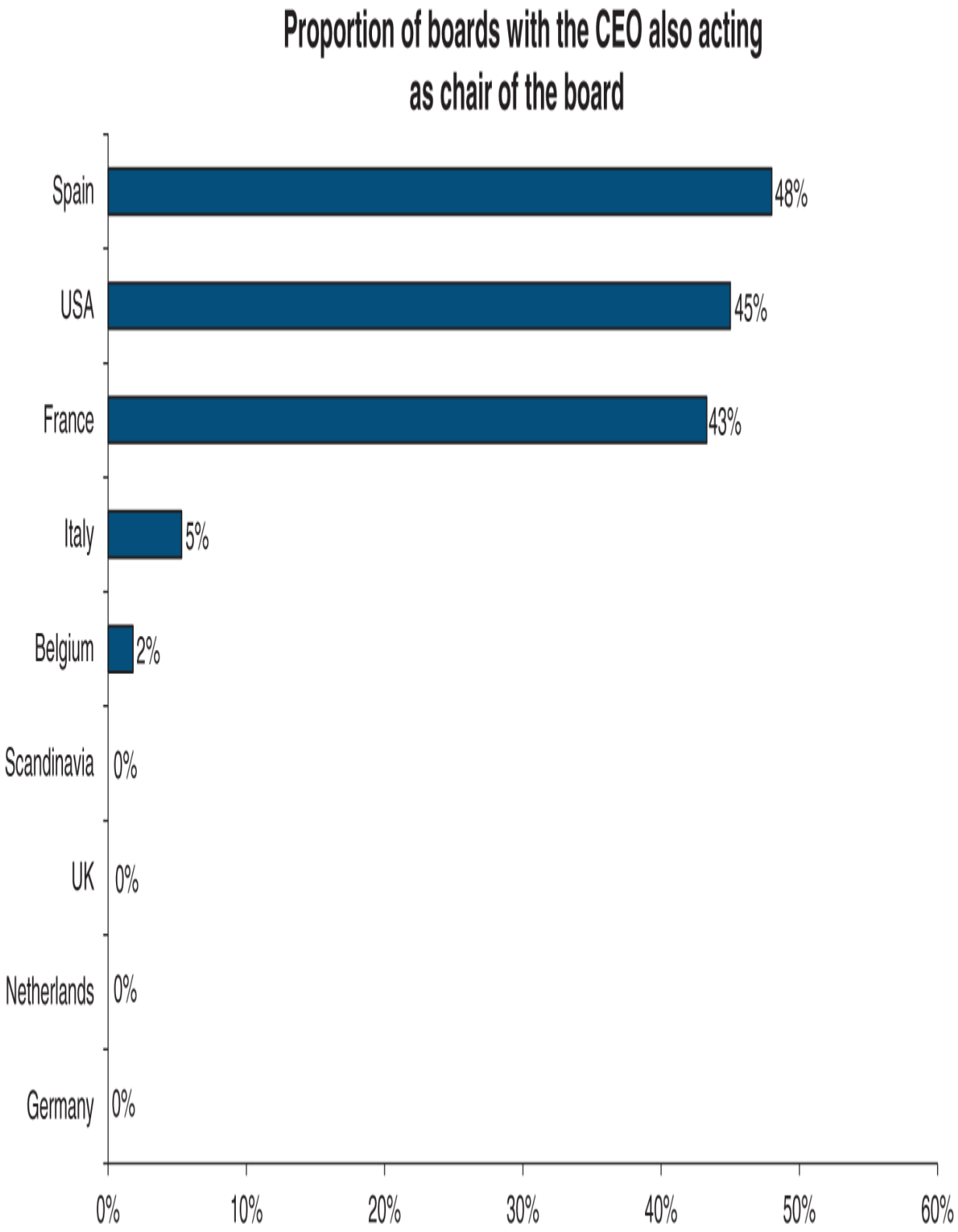
3/ A ONE-TIER OR A TWO-TIER BOARD: AN UNRESOLVED ISSUE

The way in which power within the board is organised is, in itself, a much debated topic. The need for a body that is independent of the management of the company remains an open question. We can observe three main types of organisation:

board of directors with a chief executive officer acting also as chairperson of the board. This means that a great deal of power is concentrated in the hands of one person, who is head of the board and who also manages the company. This is known as a one-tier structure and is in place at groups such as ExxonMobil, Amazon and Telefónica;

board of directors with an executive or a non-executive chairperson and a separate chief executive officer. This sort of dual structure has been adopted by Infosys, Sony and Vodafone;

supervisory board and executive board: this two-tier structure is in place at Sanofi, BMW and Philips.



Source: Data from Board Governance, International Comparison, Spencer Stuart, 2020

A board on which the control and management roles are exercised by two different people should, in theory, be more effective in controlling management on behalf of the shareholders. Is this always the case in practice? The answer is no, because it all depends on the quality and the probity of the men and women involved. Enron had a chairman and chief executive officer, and L'Oréal has a chief executive officer also acting as chairman of the board. The former went bankrupt in a very spectacular way as a result of fraud and the latter is seen as a model for creating value for its shareholders.

So it is much better to have an outstanding manager, and possibly even compromise a bit when it comes to corporate governance, by giving the manager the job of both running the company and chairing the board, rather than to have a poor manager. Even if extremely well controlled by the chair of the board, a poor manager will remain a poor manager!

An additional question arises when it comes to the choice of the chairperson of the board: can they be the former CEO? Certainly not in the UK. If this were the case, the margin for manoeuvre of the new CEO would be restricted, as the chairperson will be tempted to keep some kind of management role. The chairperson is usually recruited from outside the company, and is often a former CEO of a company in another sector who will spend one or two days a week performing the job of chairperson.

In France or Germany,[6] for example, this is often the case, on the basis of the fact that the new chairperson's experience and knowledge of the company will be highly valuable. The split between the two functions often comes at the time of succession, so that the new CEO can prove their skills. Most of the time, the two functions are generally brought back together (Schneider, Total), but there are exceptions (Sanofi).

> There is no straight answer to the question of whether it is best to combine the functions of management and control. Each case has to be assessed on its merits, taking into account the shareholder structure and the personality of the managers. Nothing is set in stone.

It cannot be denied that great strides forward have been taken in the area of corporate governance, even if there is still progress to be made in some

emerging countries with less experience in dealing with listed companies and minority shareholders. Associations of minority shareholders, or minority shareholder defence firms, which also provide shareholders with advice on how to vote in general meetings, have often acted as a major stimulus in this regard.

The fact that, in developed countries, many groups have simplified their structures has made this a lot easier: these days, it is usually only the parent company that is listed, which eliminates the possibility of conflicts of interest between the parent company and minority shareholders of its subsidiaries;[7] cross-holdings between groups which used to swap directors have been unwound;[8] assets used by the group but which belong to the founders have been apportioned to the group.

4/ ESG GOVERNANCE IN THE COMPANY

It is a bit of a mirroring device to talk about ESG governance because the “G” in ESG represents governance. Thus, the purpose of ESG is to ensure good governance of the company.

But structuring actions to improve the company's impact on the environment and society and maintaining good governance requires the establishment of governance. In some countries, the first link can be integrated into the company's articles of association, which can adopt a *raison d'être* allowing the company to commit resources to a goal other than the creation of value for its shareholders and thus set itself precise environmental and social objectives.

To go further, the company may decide to become a B-Corp or similar mission-driven company. The B-Lab provides certification to corporates that meet certain criteria in matters of sustainability and inclusion.

Some people argue that retaining the status of a B-Corp or mission-driven company can act as a poison pill to avoid takeovers. We do not think so; first of all, because those companies must nevertheless take care of their financial performance. Non-performing companies will not be able to ensure their mission in the long term. Moreover, abandoning the mission or the B-Corp status is even easier than adopting it …

Section 43.2 CORPORATE GOVERNANCE AND FINANCIAL THEORIES

1/ THEORY OF MARKETS IN EQUILIBRIUM

The classic theory is of little or no help in understanding corporate governance. What it does is reduce the company to a black box, and draws no distinction between the interests of the different parties involved in the company.

2/ AGENCY THEORY

Agency theory is the main intellectual foundation of corporate governance. The need to set up a system of corporate governance arises from the relationship of agency that binds shareholders and managers. Corporate governance is the main means of controlling management available to shareholders. What corporate governance aims to do is to structure the decision-making powers of management so that individual managers are not able to allocate revenues to themselves at the expense of the company's shareholders, its creditors and employees and, more generally, society as a whole.

Governance also aims at reducing the natural information asymmetry that exists between management and shareholders, corporate governance also covers financial communication in the very broadest sense of the term, including information provided to shareholders, work done by auditors, etc.

A good system of corporate governance, i.e. a good set of rules, should make it possible to:

limit existing or potential conflicts of interest between shareholders and management;

limit information asymmetry by ensuring transparency of management with regard to shareholders.

Corporate governance can help to resolve potential conflicts between shareholders and management in the same way as stock options, restrictions arising from a large debt[9] or a hostile takeover bid[10] do. The difference is that corporate governance is a preventative measure.

Unsurprisingly, agency theory shows that in firms where there are few potential conflicts of interest between shareholders and management and where information asymmetry is low, i.e. in small and medium-sized companies where, more often than not, the manager and shareholder is one and the same person, corporate governance is not an issue.

3/ ENTRENCHMENT THEORY

Agency theory suggests mechanisms for controlling and increasing the efficiency of management. Entrenchment theory[11] is based on the premise, somewhat fallacious but sometimes very real, that mechanisms are not always enough to force management to run the company in line with the interests of shareholders. Some managers' decisions are influenced by their desire to hold onto their jobs and to eliminate any competition. Their (main) aim is to make it very expensive for the company to replace them, which enables them to increase their powers and their discretionary authority. This is where the word “entrenchment” comes from. Managerial entrenchment and corporate governance do not make good bedfellows.

Section 43.3 VALUE AND CORPORATE GOVERNANCE

An initial response to the question “Does good corporate governance lead to value creation?” is provided by a survey of institutional investors carried out by McKinsey.[12] The investors surveyed stated that they would be prepared to pay more for shares in a company with a good system of corporate governance in place. The premium investors are prepared to pay in countries where the legal environment already provides substantial investor protection is modest (12%–14% in Europe and North America), but very high in emerging countries (30% in Eastern Europe and Africa).

The very large number of studies on the subject focus on the problem of coming up with a definition of good corporate governance. Existing studies merely rely on ratings provided by specialised agencies to back up their conclusions, which in our view provides no new insight into the subject.

Their results[13] show that good corporate governance does lead to the creation of shareholder value. Bauer, Guenster and Otten have shown that the shares of groups listed on the FTSE 300 that were given a good rating for their corporate governance performed significantly better than groups with “weak” corporate governance. These results tie in with results for US companies put forward by Gompers.

The results are all the more revealing when one considers that local law does not guarantee satisfactory corporate governance. For example, it would appear that a Russian group that adopts (and communicates) an efficient system of corporate governance will create value (Black 2001).

More generally, Anderson and Reeb in the USA and Harbula in France have shown that the financial performance of companies with one main shareholder (for example, a family) is better than average. But the best-performing companies are those with one major shareholder and also a fairly large free float. Ideally, the main shareholder should hold a stake of between 30% and 50% in the company's share capital. This may seem counterintuitive, in as far as family-owned companies are generally less transparent and comply less willingly with the rules of corporate governance. On the other hand, majority or dominant shareholders are very

motivated to ensure that their firms are successful, given that such firms often represent both the tools of their trade and their entire fortune!

> Research has shown that the best guarantee for the creation of value is the strong motivation of the management team, rather than a perfect system of corporate governance. If a company manages to achieve both at the same time, so much the better, but let's get our priorities straight!

Research focuses mostly on the correlation between good corporate governance and high valuations. Very few studies have been able to demonstrate any real correlation between corporate governance and the long-term financial performance of the company. But then nobody has shown that corporate governance has a negative impact on financial performance either!

SUMMARY

The summary of this chapter can be downloaded from www.vernimmen.com.

Broadly speaking, corporate governance is the organisation of the control over, and management of, a firm. A narrower definition of corporate governance covers the relationship between the firm's shareholders and management, mainly involving the functioning of the board of directors or the supervisory board.

Corporate governance is determined, first and foremost, by company law, but there are also a number of reports and best-practice codes that complement the recommendations and guidelines contained in the strictly legal framework.

These recommendations and guidelines deal with subjects such as transparency in the functioning of the board of directors, the choice of directors, the role and independence of the board, and the setting up of specialised committees to help the board in its work.

Corporate governance is one of the main means of reducing agency costs arising out of the potentially damaging relationship between shareholders and management.

Studies on corporate governance and value tend to demonstrate that good corporate governance will create value. This is even more the case for large firms based in countries where the legal framework is very loose. For small firms, the cost of introducing a sophisticated system of corporate governance can be prohibitive. Generally, there is less need for such a system in smaller firms where the managers are often the main shareholders (which prevents conflicts of interest) and there are very rarely minority shareholders.

QUESTIONS

1/Which financial theory best explains the development of corporate governance?

2/Why has corporate governance mainly developed at listed companies?

3/How do stock options help in aligning the interests of managers with those of shareholders? What are their limitations?

4/Name a firm where practically half of the 18 directors were independent, which did not prevent it from discovering peculiar practices after their CEO was arrested.

5/What is the danger when a board has specialised committees?

6/What should an overworked director who has only been able to attend every other board meeting do?

7/What is the most important – an independent director, a hard-working director, a competent director or a courageous director? What is the ideal?

8/In which kind of countries is it more important for a firm to have a system of corporate governance in place?

9/What is the link between corporate governance and the cost of capital?

10/Does the regular rotation of a firm's statutory auditors improve corporate governance?

11/Is corporate governance relevant at companies over which the state exercises full control?

12/What are your views on a firm that replaces its one-tier board with a two-tier board and then, a few years later, reverts to a one-tier board, like Vinci did, or which asks its CEO to be chair of the board as well before reverting to the previous system a few years later, like Nestlé did?

13/Is it a good idea, with a view to providing directors with better information, for the auditor to be a director of the company as well?

14/What are the pros and cons of separating the position of chair of the board from that of CEO?

You'll find more questions at www.vernimmen.com.

ANSWERS

Questions

1/*Agency theory.*

2/*Agency costs are lower at unlisted companies (less widely held capital, shareholders closer to management). It could be too expensive for small firms to introduce sophisticated corporate governance systems.*

3/*They provide an incentive to managers to create value for shareholders of which they will capture a part through their stock options. Drawbacks are focusing management's attention on the value of their stock options and not on the value of the share: no dividend, high risk taken, especially since the stock-options were given for free to managers and not acquired.*

4/*Renault-Nissan. The independence of directors is not sufficient if they miss lucidity and courage facing a charismatic CEO who has a stunning career.*

5/*The other directors may not always assume their full responsibility and the committee may turn into a decision-making body instead of a body that prepares all of the directors for making decisions.*

6/*Resign. The position of director is not just a fancy title, it's a job like any other.*

7/*A competent and courageous director. If possible, all four!*

8/*In countries where ownership rights are less secure, i.e. emerging countries.*

9/*Good corporate governance should reduce the cost of capital, because it eliminates the risk of poor management and/or fraud, which would penalise minority shareholders.*

10/*On paper, yes, because it means that a new set of eyes will be looking at recurrent problems. But this has not been borne out by academic research.*

11/*Yes, there is no reason why not, since conflicts of interest can also exist between the state and the managers of state-run companies.*

12/*It's an intelligent move, demonstrating the ability to adapt to change. Sometimes a change in structure is needed when there's a new manager at the head of a group.*

13/*No, as a matter of fact, it's not allowed. Nobody can be a judge and a party to the project.*

14/*Separating the role of control and management, of long-term decisions and day-to-day management, doubles the number of top corporate officers. Personal conflicts may arise which make it unmanageable.*

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NOTES

1 *Based on the OECD approach.*

2 *In some countries, such as the UK and France, listed companies are required to disclose whether or not they implement codes of corporate governance, which is clearly a very strong incentive for them to do so! This is called the "Comply or Explain" principle.*

3 *See Section 24.3.*

4 *Depending on whether the shares the investor holds carry double voting rights or not.*

5 *This restriction will no longer apply if, following a takeover, a third party is in possession of more than 66.7% of the shares.*

6 *After a period of two years, unless approved by 25% of shareholders.*

7 *Take the example of Allianz, which bought out the minority shareholders of its listed subsidiary Euler Hermes, making it a wholly owned subsidiary.*

8 *For example, Deutsche Bank is no longer a large shareholder in large German groups.*

9 *See Section 33.2.*

10 *See Section 45.3*

11 *Initially developed by A. Shleifer and R. Vishny.*

12 *McKinsey Investor Opinion Survey, 2002.*

13 *See Bibliography.*

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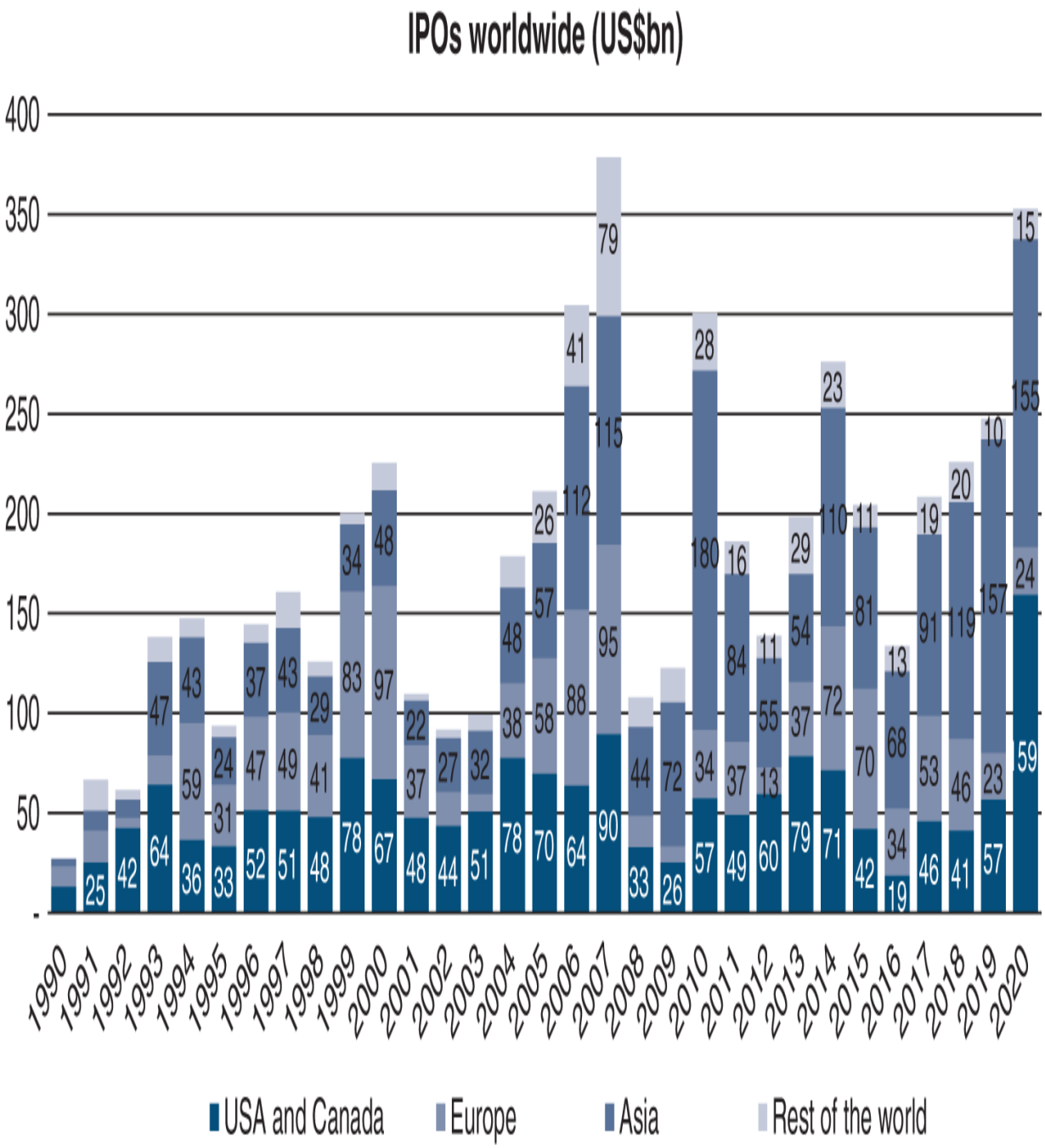
Chapter 44
INITIAL PUBLIC OFFERINGS (IPOS)

Welcome to the wonderful world of listed companies!

Theoretically, the principles of financial management that we have developed throughout this book find their full expression in the share price of the company. They apply to unlisted companies as well, but for a listed company, market approval or disapproval – expressed through the share price – is immediate. Being listed enables companies to access capital markets and have a direct understanding of the market value of their companies.



Source: Thomson One Banker, Factset

Being listed enables a company to raise funds in a few weeks or even a few days because:

financial analysts periodically publish studies reviewing company fundamentals, reinforcing the market's efficiency;

listing on an organised market enables financial managers to “sell” the company in the form of securities that are bought and sold solely as a function of profitability and risk. Poor management is punished by poor share price performance or worse – from management's point of view – by a takeover offer which leads to a change in management;

listed companies must publish up-to-date financial information and file an annual report (or equivalent) with the market authority.

We refer the reader interested in the reasons for an IPO to Section 42.2 where we discuss this topic.

Section 44.1 PREPARATION OF AN IPO

It usually takes at least six months between the time the shareholders decide to list a company and the first trading in its shares.

This six-month period provides an opportunity for management to revisit some financial decisions made in the past that were appropriate for an unlisted, family-owned company or for a wholly owned subsidiary of a group, but which would not be suitable for a listed company with minority shareholders, such as:

preparing accounts in line with accounting standards required for listed companies which may be different from the ones used by private companies, and introduce reporting procedures that cover the whole of the entity to be listed;

reviewing the group's legal structure in order to ensure that vital assets (brands, patents, customer portfolios, etc.) are fully owned by the group and that the group's legal form and articles of association are compatible with listing (no simplified joint-stock companies and no pre-emptive rights or special agreements in the articles);

reviewing the group's operating structure, ensuring that it is an independent group with its own means of functioning and that it does not retain the structure of a division of a group or a family-run business (terminate employment contracts with non-operational family members, take out necessary insurance policies, draw up management agreements, etc.);

drawing up a shareholders' agreement if needed (see Chapter 41);

introducing corporate governance appropriate for a listed company (independent directors, control procedures, board of director committees, etc. – see Chapter 43);

reviewing the company's financial structure in order to ensure that it is similar to that of other listed companies in the same sector. This applies particularly to companies under LBO, which will have to partially deleverage via a share issue, at the latest at the time of listing;

adopting a well-thought-out dividend policy that is sustainable over the long term and that will not compromise the group's development (see Chapter 36);

introducing a scheme for providing employees with access to the company's shares through the allocation of free shares and/or stock options, etc. (see Chapter 42);

defining the company strategy in a form that is simple and easy to communicate, which will become the equity story to be told to the market at the time of listing.

From the start of this phase, the company should seek the assistance of an investment bank, which will act as a link between the company and the market. The company will also have to retain the services of a law firm, an accounting firm and possibly a PR agency.

The overall cost of the IPO is between €0.5m and €1m in fixed costs (lawyers, communications agency, roadshows) plus between 5% and 7% of funds raised as fees for the bank syndicate.

Even with this help, the management team will have a very heavy overload of work during these six months because the operational side will not have to be sacrificed for all that!

Section 44.2 EXECUTION OF THE IPO

1/ CHOOSING A MARKET

With rare exceptions, the natural market for the listing is the company's home country. This is where the company is best known to local investors, who are the most likely to give it the highest value. There are obviously a few exceptions, such as L'Occitane and Prada, which elected for a Hong Kong listing (given that both companies' activity is highly developed in Asia) and Criteo, which chose New York to facilitate its US expansion and where most of its peers were listed. But only a very small number of companies from major European countries are not listed in their home country.

Having said that, some stock exchanges act as magnets for some sectors, such as New York for technology companies or London for mining groups.

The next question is whether there should be a second listing on a foreign market. Listing on a foreign market generally triggers direct and indirect costs without any guarantee of greater liquidity or a higher valuation of the company.

Only groups from emerging countries, when their local market is underdeveloped (Russia, Latin America, etc.), gain a clear advantage from a listing in New York, London, Paris or Hong Kong. The Nigerian e-commerce group Jumia is a good example, with its listing in New York in 2019. The Swiss-based mining and trading group Glencore chose London (and Hong Kong) as most mining groups are listed in London.

2/ SIZING THE IPO

Over and above the choice of a stock market (or several) for listing, a certain number of parameters will have to be fixed, including the size of the IPO and the choice between a primary offer (share issue), a secondary offer (sale of shares by existing shareholders) or a mix of the two.

These decisions will be made based on the following:

whether existing shareholders want to convert all or part of their stakes into cash;

whether the company needs funds to finance its growth or to deleverage;

the need to put a sufficient number of shares on the market so that the share can offer a certain amount of liquidity;

the need to limit the negative signal of the transaction.

These constraints can sometimes turn out to be contradictory. For example, the sale of all of the existing shares on the market by existing shareholders is rarely considered, as this would send a very negative signal to the market. So, when the IPO includes the sale by one or more major shareholders of some of their shares, they will generally be asked to undertake to hold onto the shares that have not been sold for a given period (6–12 months) so as to avoid any heavy impact on the market if they were to sell large volumes of shares immediately after the IPO. This undertaking, or lock-up clause, acts as a reassurance to the market and tempers the negative signal of the operation.

It may also be a good idea to combine the sale of shares by existing shareholders with a capital increase, even if the company has no immediate need of funds. The message sent by an IPO through a capital increase is, by definition, more positive. The newly listed company will be able to speed up its development and to tap a new source of funding, which is why most IPOs are partly primary, whether to a larger or smaller degree.

THE 10 LARGEST IPOS WORLDWIDE OF ALL TIME

Rank	Company	Stock exchange	Sector	Proceeds ($bn)	Year
1	Saudi Aramco	Saudi Arabian stock exchange	Oil	25.6	2019
2	Alibaba	New York (NYSE)	Ecommerce	25	2014
3	Agricultural Bank of China (ABC)	Shanghai and Hong Kong	Bank	22	2010
4	Softbank	Tokyo Stock Exchange (TSE)	Conglomerate	21.3	2018

Rank	Company	Stock exchange	Sector	Proceeds ($bn)	Year
5	Industrial and Commercial Bank of China (ICBC)	Shanghai and Hong Kong	Bank	19.1	2006
6	NTT DoCoMo	Tokyo Stock Exchange (TSE)	Telecom and Internet	18.1	1998
7	Visa	New York (NYSE)	Financials	17.9	2008
8	AIA	Hong Kong (HKEx)	Insurance	17.8	2010
9	Enel	Milan and New York (NYSE)	Utility	16.5	1999
10	Facebook	New York (NASDAQ)	Internet	16.0	2012

Source: Dealogic.

3/ IPO TECHNIQUES

While the classic method of listing remains the constitution of an order book (see Chapter 25), two new techniques have developed strongly in recent years: direct listing and merger with a SPAC (Special Purpose Acquisition Company).

Direct listing is a simple IPO method: a company wishing to become listed simply lists its shares on a regulated market and lets supply (from shareholders wishing to monetise their investment) and demand (from investors wishing to buy shares) set the equilibrium price. In the United States, a reference price is indicated but is not binding. This technique does not therefore require the intervention of a bank as is the case for IPOs by setting up an order book.

This technique is normally less costly than an IPO through the creation of an order book because the company saves the banks' fees and, above all, the

operation is theoretically carried out without any discount for the selling shareholders.

But direct listing does not only have advantages. First of all, the company cannot raise funds by this method, only existing shares are exchanged. Furthermore, the sale of large blocks of shares is not possible or not optimal. Indeed, investor demand may be relatively limited in the absence of a major marketing exercise carried out by the banks in building up the order book (book building with meetings with investors, distribution of analysts' notes, etc.). Finally, in the absence of a method for price discovery before listing (which is in reality book building), and of mechanisms for limiting price variations (greenshoe, lock up), the volatility of the price during the first few weeks of listing is likely to be significantly higher in the case of a direct listing than in the case of a traditional IPO.

A direct listing is therefore reserved for a certain type of company: one that is already well known to investors (and therefore generally large), with an already large shareholder base (often consisting in part of the company's employees), wishing to provide liquidity to its shareholders, but not needing to raise funds.

Spotify chose this IPO mode in 2018 followed by Slack in 2019 and Asana and Palentir in 2020. In Europe this technique has been used mainly in the case of spin-offs (e.g. ArcelorMittal/Aperam, HiPay/HiMedia).

SPACs or “blank cheques companies” are shells that get listed with the intention of acquiring and merging within 18–24 months with a private operating company (which will then become a listed company). The shareholders of SPACs have the right to vote for or against the acquisition (known as despacking). This is obviously crucial as it allows the SPAC to fulfil its mission. If the management of a SPAC fails to find a suitable target within 18–24 months, the vehicle is dissolved and the funds returned to the shareholders. At the time of despacking, shareholders may also choose to have their initial investment returned to them. Paradoxically, this latter option actually encourages them to vote for the deal regardless of their views on the transaction. If they think the deal is going well, they vote for it and stay; if not, they vote yes and exit and ask for their shares to be returned. But by asking for the exit, they can jeopardise the operation

because if the SPAC does not have enough funds to complete the acquisition, it is cancelled.

It is quite rare that the transaction is completed for an amount less than or equal to the amount raised by the SPAC initially (a few hundred million euros). If the target is larger, either the target's shareholders remain shareholders (majority or not) in the listed company, or the SPAC raises funds again from institutional investors at the time of the acquisition (this is known as PIPE, Private Investment in Public Equity). This is a second validation by the market of the rationale and price of the acquisition.

The management of SPAC receives almost 20% of the shares for free when SPAC is created and listed. The management invests limited funds (a few million dollars or euros) but they are really at risk, because if SPAC does not despack, the funds are lost (these funds pay for the operating costs of SPAC and the costs of its listing).

When the initial shareholders of the SPAC target are paid in SPAC shares, the operation has the same result as a classical IPO with some differences:

For the exiting shareholders, selling to a SPAC means saving the IPO discount since the company is sold privately.

For the remaining shareholders, if the company has to raise funds during the operation, the IPO discount must be set against the dilution linked to the free shares of the SPAC's management and the warrants (issued at the time of the IPO and allowing to subscribe to new shares at a higher price, generally $11.5 for shares issued at $10).

For institutional investors, they do not benefit from the IPO discount but they guarantee themselves a place in the operation, which an allocation in a classic IPO would not have allowed.

The real losers are the investment banks who receive a much lower fee than in a traditional IPO.

These new methods still suffer from an image problem: direct listing exists in Europe, but mainly for small companies; SPACs are often regarded as the operations of financial pirates. But their institutionalisation in the US, with 219 SPACs raising $79bn (compared with $67bn for traditional IPOs in 2020), may change this image. Although their acceleration at the beginning of 2021 (340 SPACs raising $106.6bn) may give rise to fears of a

speculative boom that will deflate, without them falling back into the margins. A few SPACs have gone public in Europe.

Atypically, some small unlisted companies are being absorbed by a listed structure, without operational activities or having previously sold them (a “shell”), in order to access the listing more quickly and at lower cost (AAA in 2021). But in most cases, a free float has to be recreated.

Section 44.4 UNDERPRICING OF IPOS

If statistics are to be believed, the share price of a newly floated company generally – but there are a number of exceptions – sees a small rise over the IPO price in the days following flotation (see Section 25.2). It would also appear that this discount at which shares are sold or issued at the time of an IPO is volatile over time, compared with an equilibrium value – high in the 1960s, lower in the 1970s to 1980s, and then high again in the 2000s before dropping in recent years. Following research, many different explanations for this discount have been put forward. The main ones are:

This underpricing is theoretically due to the asymmetry of information between the seller and the investors or intermediaries. The former has more information on the company's prospects, while the latter have a good idea of market demand. A deal is therefore possible, but price is paramount.

Signal theory says that the sale of shares by the shareholders is a negative signal, so the seller has to “leave some money on the table” in return for ensuring that the IPO goes off smoothly and to investors' satisfaction.

Asymmetrical information amongst the different investors. “Informed” investors will only be interested in good deals and will not be tempted by overvalued IPOs. Less well-informed investors, who will thus be involved in all financings, will find that they are better served in unattractive operations. They will not be as present on more attractive deals. In seeking to retain all the investors who provide valuable and necessary liquidity to the market, IPOs are carried out at a discount.

There are some who argue (not very convincingly) that underpricing can limit the risk of legal disputes with investors who would feel as if they had been swindled because they'd made a bad investment.

Section 44.5 HOW TO CARRY OUT A SUCCESSFUL IPO

The fact that a number of IPOs are cancelled or postponed (2018–2020 has seen, amongst others, tech start-ups WeWork and Airbnb in the USA, petrochemical company Sibur in Russia) shows that this is a tricky process and that success is not always guaranteed.

A successful IPO is the combination of a number of factors:

the intrinsic quality of the company: market share, growth and clarity of the activity, management experience, capital structure, should not be unusual, etc. These factors are assessed on the basis of comparable companies that are already listed, since the listing of the company is offering a new choice to investors within the same investment universe;

a clear and convincing explanation of the sellers' motivations, as the market will always fear that they are selling their shares because their best results have already been achieved. This is why a flotation through a share issue for financing investments is preferable to the sale of shares (signalling theory);

agreement on the price, which is much easier to achieve when the stock markets are performing well, and very difficult to achieve when they are performing badly. This is the most frequent reason for cancelling an IPO.

From a tactical point of view, and when the stock markets are performing badly, marketing is crucial. Readers, who have been aware since Chapter 1 that a good financial director is first and foremost a good marketing manager, will not be surprised! Marketing involves:

familiarising investors with the stock market candidate a few months before the roadshows themselves begin, through informal meetings (pilot fishing);

entry into the company's capital by investors seen as cornerstone investors a few weeks before the IPO when the regulations allow this, or during the IPO but with a guaranteed allocation, which will encourage other investors to follow suit. This is particularly prevalent in Asia. Thus, Thailand's largest retailer, Central Retail Corp, welcomed Singapore sovereign wealth fund GIC and funds run by Capital Research Management as international cornerstone investors backing its IPO in January 2020; an anchor investor is an institutional investor placing a large order in the order book, thereby acting as a valuation driving force. The Monetary Authority of Singapore acted as an anchor investor in the March 2020 IPO of SBI Cards.

tight management of communication over the envisaged price. For example, Glencore let it be known that it was considering a flotation of over $60bn and when a lower price was announced, this was perceived as good news. This is called behavioural finance! It is true that the difficulty of valuing this complex group made this manoeuvre much easier;

a price seen as lower than the equilibrium value, enabling investors to hope for capital gains after a few months. For example, Shurgard fixed its IPO price at the bottom of the indicative bracket. Seven days after listing, the share price stabilised at 13% above the IPO price.

Sometimes the market is a buyers' market, and these buyers do not hesitate to twist the arm of investors seeking liquidity. It is just as well to be aware of this and not try to play another game if you want to list a company on the stock exchange.

The first days of listing are crucial, because starting a stock market career with a share price that is lower than the IPO price (Uber in May 2019) does not make a very good impression on investors. On the other hand, slightly undervaluing the share when it is listed means that the price will rise by a few percentage points during its first days of listing. This puts everybody in a good mood!

Finally, in the long term the company and its managers will have to learn to live with daily constraints on their behaviour imposed by the periodical distribution of financial information, by managing earnings so as not to disappoint investors and thereby risk lower levels of investment than an unlisted company might face, and because they will be taking fewer risks in general. Furthermore, all shareholders must be treated equally, and

managers are going to have to get used to the value of the company being published every day; sometimes this value will be low even though results are good. This can have an impact on the morale of employees and on shareholders' assets, and it could lead to a change of control in the event of major changes in the capital structure.

That's just life on the stock exchange!

Section 44.6 PUBLIC TO PRIVATE

A company (or the shareholders) will first start considering a public-to-private move when the reasons why it decided to list its shares in the first place, for the most part, become irrelevant. It has to weigh the cost of listing – direct costs: stock exchange fees, publication of annual reports, meetings with analysts, employment of investor relations staff; and indirect costs: requirement to disclose more information to the public and to competitors, market influence on strategy, management's time spent talking to the market, etc. – against the benefits of listing when deciding whether the company should remain listed or not. This is especially the case if:

the company no longer needs large amounts of outside equity and can self-finance future financing requirements. The company no longer has any ambition to raise capital on the market or to pay for acquisitions in shares;

the stock exchange no longer provides minority shareholders with sufficient liquidity (which is often rapidly the case for smaller companies which only really benefit from liquidity at the time of their IPO). Listing then becomes a theoretical issue and institutional investors lose interest in the share;

the annual cost of the listing (starting at €200k for a small company and running into millions for larger ones) has become too expensive in comparison with the benefits;

the company no longer needs the stock exchange in order to increase awareness of its products or services.

The second type of reason why companies delist is financial. Large shareholders, whether majority shareholders or not, may consider that the share price does not reflect the intrinsic value of the company. Turning a problem into an opportunity, such shareholders could offer minority shareholders an exit, thus giving them a larger share of the creation of future value.

The operation can be complex. Indeed, beyond the technical constraints, it will depend on the ability of the majority shareholder to convince the minority shareholders to sell their shares. Alternatively, for companies with dispersed capital, it will be necessary to find a new investor ready to make an offer, usually with recourse to debt. Delisting is possible if the majority

shareholder exceeds a threshold, often 90% or 95%, as it is then obliged to acquire the rest of the shares. This is known as a squeeze-out. In practice, this amounts to forcing minority shareholders to sell any outstanding shares. Because this is a form of property expropriation, the price of the operation is analysed very closely by the market regulator. In most countries, a fairness opinion has to be drawn up by an independent, qualified financial expert.

If investors are below the squeeze-out threshold, they first have to launch an offer on the company's shares, hoping to go above the squeeze-out threshold so as to be able to take the company private. This is a P-to-P, public-to-private, deal.

Following a change of control, the new majority shareholder who wishes to hold 100% of the capital of its new subsidiary in order to more easily implement the expected synergies will then have to proceed with a delisting through a squeeze-out.

> Being listed is never a dead end, as a company can become private again and come back on to the stock exchange years later.

SUMMARY

The summary of this chapter can be downloaded from www.vernimmen.com.

An IPO is a complex process that generally takes around six months to complete. During the preparation phase, the whole of the company's legal, operational and financial structure has to be reviewed, its corporate governance needs to be adapted, financial statements may have to be drawn up in line with the relevant accounting principles and a strategy has to be defined in the form of an equity story for the market.

A company is generally listed in its country of origin. The choice of the market segment on which the company will be listed will be determined by the size of the company and by any constraints weighing on it.

The number of shares offered on the market will depend on the sizing of the IPO, and whether the shares will be shares sold by existing shareholders and/or new shares in the company's capital that are issued at the time. This will depend on the financial needs of the company, the shareholders' desire for control and their liquidity needs, and market constraints.

At the time of the IPO, shares are generally sold on the market at a discount compared with the first listed price. Different theoretical explanations, based mainly on information asymmetry, have been put forward to explain this.

IPOing a company is a complex process and success cannot be taken for granted. Even at the last minute, a forced postponement or a cancellation may be necessary.

SPACs are an increasingly popular form of stock market listing. It involves an unlisted company acquired or merging with an ad-hoc structure with no activity that has gone public a few quarters earlier with this objective.

Delisting may be a good option when the company no longer requires funds or when liquidity has become too low. Delisting can also be a complex process and an independent expert has to be brought in to draw up a fairness opinion on the squeeze-out price.

QUESTIONS

1/Why might a majority shareholder prefer to sell its stakes in a company through an IPO rather than a straight sale to an investor?

2/Why would a company with an 85% stake in a subsidiary launch a takeover bid for the remaining shares?

3/Why do companies that list their shares on the stock market have, more often than not, to change their corporate governance?

4/Why is it difficult for a sole shareholder to sell 100% of their shares when the company undertakes an IPO?

5/In response to a question about his expectations of Hermès' new financial strategy at the time of its IPO, Jean-Louis Dumas, Hermès' CEO, replied that he hoped that his grandchildren would be proud of him. Comment.

6/What are the risks run by a company that carries out an IPO just because IPOs are fashionable?

7/What are the risks of an IPO?

8/What will a company with a large number of shareholders that does not want to get a listing on the stock exchange have to do sooner or later?

9/Verallia is the world's third largest producer of glass packaging for food and beverages. A former subsidiary of Saint-Gobain, it was acquired in an LBO by the Apollo investment fund in 2015 and was floated on the stock market in October 2019. Verallia achieved sales of €2.4bn in 2018, up 6%, EBITDA of €544m (+14%), current operating income of €221m (+39%) and net income of €49m (×3.5). Net bank and financial debt at 30 June 2019 was €1.7bn, after capitalisation by Apollo of a €250m loan to Verallia. Expected EBITDA for 2019 was €610m.

The IPO took the form of a placement of existing shares for €963m. The IPO price was €27; 5 days later, the share price was €27.1. At this price, the market capitalisation was €3.2bn with a free float of 39%.

Why could Verallia's IPO have taken the form of a secondary offering? Could it have taken the form of a full primary offering?

10/What is the impact of Verallia's IPO on its income statement? On its balance sheet?

11/Is it surprising that Verallia's share price remain stable in the days following the IPO, given that Apollo had kept 62% of its shares?

More questions are waiting for you at www.vernimmen.com.

ANSWERS

Questions

1/*There might not be a buyer prepared to pay a control premium. This enables the shareholder to sell only a minority stake, thus holding on to majority control, while cashing in part of their shares. The company remains independent and is not absorbed by a larger group.*

2/*In order to get rid of minority shareholders and to implement group synergies.*

3/*Because there are now outside shareholders and an obligation to follow the rules applies to listed companies.*

4/*Because of the very negative signal that this would send out.*

5/*This highlights the conflict between the very financial approach of minority shareholders and a wider approach of managing shareholders. The two are not irreconcilable, as Hermès shares have been an excellent investment since they were listed on the stock exchange.*

6/*The risk of severe disappointment as there will be no advantage for the company compared with all of the restrictions involved in listing.*

7/*In the short term, failure during the course of the process as stock markets fall and the possible price of the placement could seem very low to existing shareholders. Over the longer term, a change in the group's culture, and a change in control (takeover bid).*

8/*Sooner or later, the company will have to be sold in order to provide shareholders with liquidity or an internal stock exchange will have to be organised among shareholders so that those wishing to sell their shares can do so without having to sell to third parties.*

9/*With a net debt/EBITDA ratio of 2.8, Verallia has a high but not excessive level of debt. This would have been possible, but not in the interest of Apollo, which would not have been able to sell some of its shares.*

10/*None (except for the IPO costs) since the transaction did not include a primary tranche that would have provided Verallia with additional equity.*

11/*LBO funds that do not sell their entire stake in an IPO, like Apollo, are careful not to overvalue the company on this occasion, as they will have to sell the remainder of their shares some time later, which will be more complicated if the investors who participated in the IPO have lost value.*

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Chapter 45
TAKING CONTROL OF A COMPANY

A peek behind the scenes of investment banking

At any given time, a company can have several valuations, depending on the point of view of the buyer and the seller and their expectations of future profits and synergies. This variety sets the stage for negotiation but, needless to say, a transaction will take place only if common ground can be found – i.e. if the seller's minimum price does not exceed the buyer's maximum price.[1]

The art of negotiation consists of allocating the value of the anticipated synergies between the buyer and the seller, and in finding an equilibrium between their respective positions, so that both come away with a good deal. The seller receives more than the value for the company on a standalone basis because they pocket part of the value of the synergies the buyer hopes to unlock. Similarly, the buyer pays out part of the value of the synergies, but has still not paid more than the company is worth to them.

Transactions can also result from erroneous valuations. A seller might think the company has reached a peak, for example, and the buyer that it still has growth potential. But generally, out-and-out deception is rarer than you might think. It's usually only in hindsight that we say we made a killing and that the party on the other side of the transaction was totally wrong!

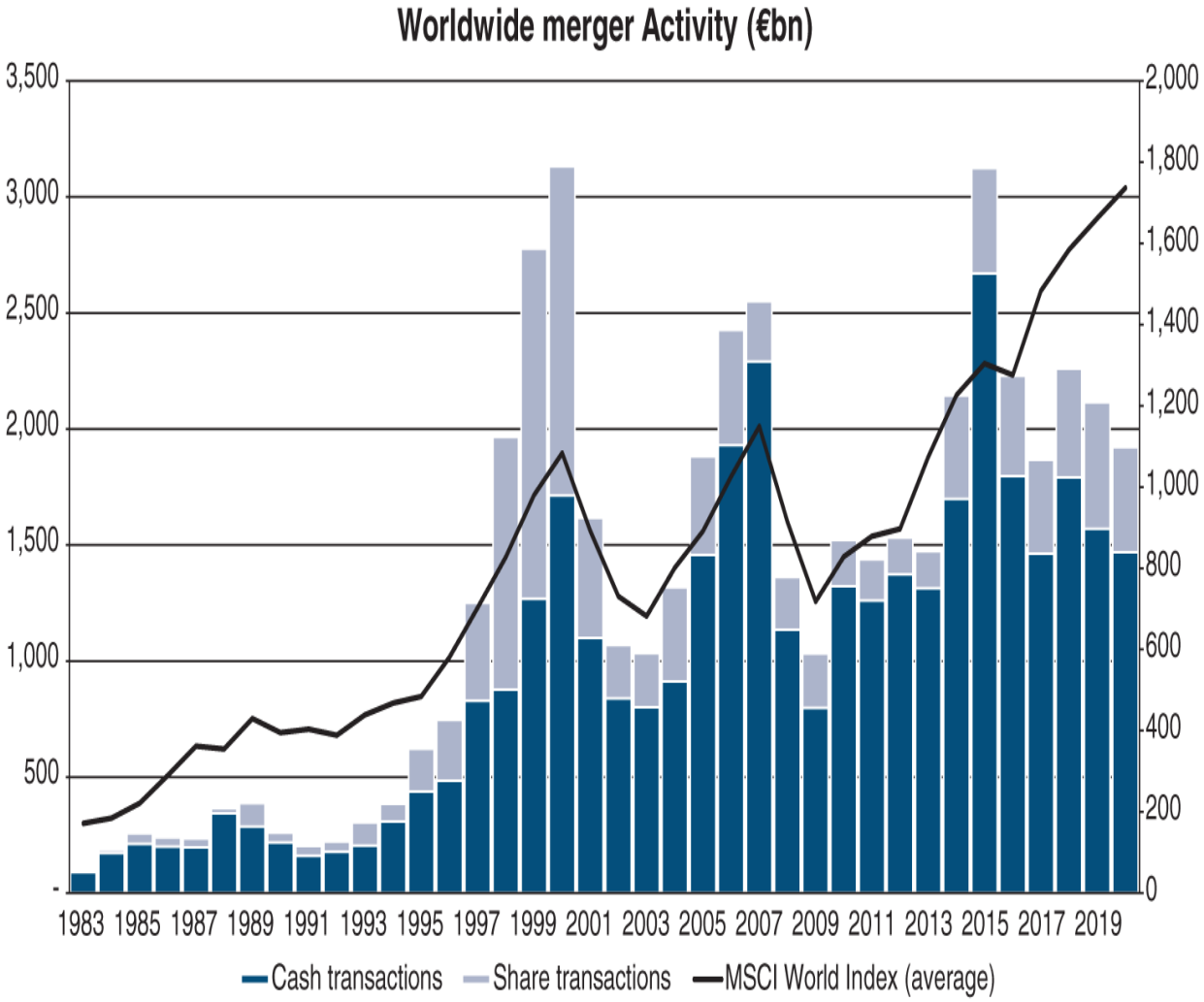
In this chapter we will focus on the acquisition of one company by another. We will not consider industrial alliances, i.e. commercial or technology agreements negotiated directly between two companies which do not involve a transaction of the equity of either of them. Before examining the various negotiation tactics and the purchase of a listed company, let us first take a look at the merger and acquisition phenomenon and the economic justification behind a merger.

Section 45.1 THE RISE OF MERGERS AND ACQUISITIONS

1/ MERGER AND ACQUISITION WAVES

Acquisitions can be paid for either in cash or in shares. Generally speaking, share transactions predominate when corporate valuations are high, as they were in 1999–2000, because absolute values do not have to be determined.

However, in less propitious times, payment in cash is highly appreciated, both by sellers, who delight in receiving hard cash which will not lose its value on the stock market, and by buyers, who are not keen to issue new shares at a price that to them would seem to be discounted. Between 2007 and 2013, cash was back in fashion!



Conversely, when the market is bearish, cash payments are more attractive to both parties. The seller receives cold, hard cash, which will not lose value as shares might, while the buyer is reluctant to issue new shares at prices they consider to be a discount to their intrinsic value.

Source: Data from Thomson One Deals, Factset

As shown in the above graph, mergers and acquisitions tend to come in waves:

In the 1960s, conglomerates were all the rage. ITT, Gulf and Western, Fiat, Schneider and many others rose to prominence during this period. The parent company was supposedly able to manage the acquired subsidiaries better, plus meet their capital needs. Most transactions were paid for with shares.

In the 1980s, most acquisitions were paid for in cash. Many of the big conglomerates formed in the 1960s were broken up. They had become less efficient, poorly managed and valued at less than the sum of the values of their subsidiaries.

In the 1990s and 2000s, companies within the same sector joined forces, generally in share transactions: Procter & Gamble/Gillette, Pfizer/Wyeth, Arcelor/Mittal, Cadbury/Kraft, etc.

In the 2010s, the logic is the same and payments are mostly in cash: Kraft/Heinz, SABMiller/AB Inbev, Lactalis/Parmalat, Air Liquide/Airgas, etc. Since 2014, as the stock market has been regaining momentum, we are seeing more and more payments in shares: Peugeot-FiatChrysler, Lafarge-Holcim, Luxottica-Essilor, Worldline-Ingenico, Sprint-T-Mobile.

It seems to us that there are three main principles that explain the cyclical nature of mergers:

when the economic situation is depressed or very bad, companies focus on their operating activities, seeking to cope with problems and to restructure. When the economy improves, they regain confidence, are more open minded and ready to consider mergers and acquisitions, which are always complicated to implement. But because the economic situation is good, they are prepared to take a risk;

the availability of equity or debt financing is crucial because an acquisition requires financing. When share prices are low, shareholders are not very keen on being diluted in conditions that are bad for them and it is difficult to carry out capital increases. Also, if share prices are low, this means that it is unlikely that the economy is booming, making it difficult to obtain debt financing. High share prices are often the consequence and the cause of more easily obtainable financing, a clear sign of optimism!;

finally, herd behaviour will encourage companies in a given sector to carry out mergers when they see another sector player initiating a merger, so that they will not be the only ones creating cost and/or revenue synergies which could give them a clear competitive advantage. This could be witnessed in 2020 in the payment industry (e.g. Worldline-Ingenico, Nexi-Sia, Rapyd-Korta).

Putting the purely financial elements aside, the determinants of mergers and acquisitions can be macroeconomic, microeconomic or human factors, as we will now see.

2/ MACROECONOMIC FACTORS

There are several determining macroeconomic factors:

Periods of innovation and technological change are often followed by merger waves. During the innovation period (computers in the 1970s, the Internet or renewable energies today), many new companies are founded. Inevitably, however, the outlook for the growth and survival of these start-ups will fade, leading to a period of consolidation (Criteo buying Manage). Moreover, start-ups' heavy financing needs may prompt them to seek the support of a major group that, in turn, can take advantage of the growth in the start-ups' business (Peugeot buying TravelCar, a carsharing rental platform).

Many companies are undergoing a change in market scope. Thirty years ago, their market was national; now they find that they must operate in a regional (European) or more often worldwide context (Syngenta-ChemChina). Adapting to this change requires massive investment in both physical and human capital, leading to much higher financing needs (pharmaceuticals). As competition increases, companies that have not yet merged must grow rapidly in order to keep up with their now larger rivals. Critical mass becomes vital (Occidental Petroleum-Anardako). The policy of creating national champions in the 2000s encouraged this race for size (GDF-Suez becoming Engie).

Legislative changes have fostered restructuring in many industries. A broad trend towards deregulation began in the 1980s in the US and the UK, profoundly changing many sectors of the economy, from air transport to financial services to telecommunications. In Europe, a single market was created in conjunction with a policy of deregulation in banking, energy and telecommunications. European governments further scaled back their presence in the economy by privatising a number of publicly held companies. In many cases, these companies then became active participants in mergers and acquisitions (EDF, Orange, ENI).

The increasing importance of financial markets has played a fundamental role in corporate restructuring. In the space of 30 years, European companies have evolved from primarily credit-based systems, where banks were the main suppliers of funds, to financial market systems, characterised by disintermediation (see Section 15.1). This structural change took place in conjunction with a shift in power from banks and other financial companies (Mediobanca, Deutsche Bank, Paribas, Générale de Belgique) to investors. Accordingly, shareholders now exert pressure on corporate managers to produce returns in line with their expectations:

- in the event of a disappointing performance, shareholders can sell their shares and, in doing this, depress the share price. Ultimately, this can lead to a restructuring (Aviva) or a takeover (Monsanto);
- conversely, companies must convince the market that their acquisitions (Occidental Petroleum-Anadarko) are economically justified.

Low population growth in Europe, combined with strict immigration control, has made it more difficult for firms to grow organically. In response, managers in search of new growth drivers will try to find M&A opportunities (Lactalis-Greenland in Egypt).

3/ MICROECONOMIC FACTORS

There are a number of different determining microeconomic factors:

By increasing their size and production volumes, companies reduce their unit costs, in particular their R&D, administration and distribution costs (Nestle-Bountiful). Moreover, a higher production volume will put the company in a better position to negotiate lower costs with its suppliers (Tesco-Booker).

Mergers can increase a company's market share and boost its revenues dramatically. To the extent that companies address complementary markets, merging will enable them to broaden their overall scope. There are two forms of complementarity:

- geographic (Banijay-Endemol). The two groups benefit from their respective presence in different regions;
- product (SandroMaje-DeFursac). The group can offer a full palette of products to its customers.

Although riskier than organic growth, mergers and acquisitions enable a company to save valuable time. In growing sectors of the economy, speed (the first-mover advantage) is a critical success factor. Once the sector matures, it becomes more difficult and more expensive to chip away at competitors' market share, so acquisitions become a matter of choice (Altice-CableVision). The idea is also to get rid of a competitor (S&P-HIS Markit). When a company is expanding internationally or entering a new business, a strategic acquisition is a way to circumvent barriers to entry, both in terms of market recognition (LVMH-Tiffany) and expertise (Apple-Voysis).

By gaining additional stature, a company can more easily take new risks in a worldwide environment. The transition from a domestic market focus to worldwide competition requires companies to invest much more. The financial and human risks become too great for a medium-sized company (oil and gas exploration, pharmaceutical research). An acquisition (paid in shares) instantly boosts the company's financial resources and reduces risk, facilitating decisions about the company's future growth (Unilever-Onnit).

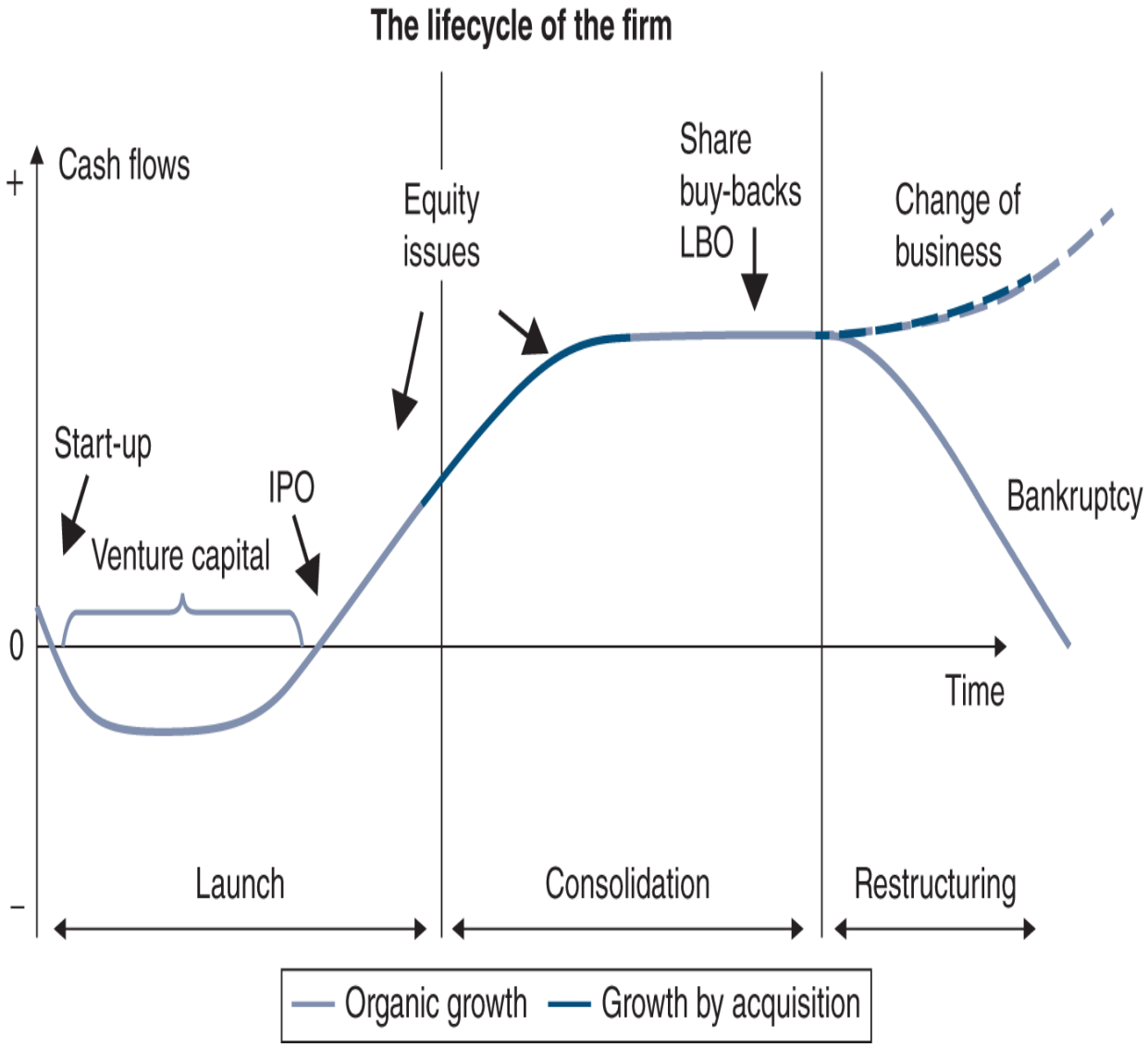
The need for cash, because groups are in difficulty (Bombardier, ThyssenKrupp), because they need to deleverage (HNA, Wanda in China) or because they regularly need to make capital gains (sale of Deutsche Glasfaser by KKR) are other reasons why M&A deals happen.

When groups decide to refocus on their core business, we also see assets being disposed of (Nestlé's disposal of Haagen-Dazs).

In addition to the economic criteria prompting companies to merge, there is also the human factor. Many companies founded between 1955 and 1980, which were often controlled by a single shareholder manager, are now, not surprisingly, encountering problems of succession. In some cases, another family member takes over (ArcelorMittal, Swatch, Benetton, Reliance). In other cases, the company may have to be sold if it is to survive (Norbert Dentressangle).

4/ THE LARGER CONTEXT

Mergers and acquisitions, regardless of how tricky they are to manage, form part and parcel of a company's life and serve as a useful tool for growth.



Mergers and acquisitions, although tricky to manage, are part of the lifecycle of a company and are a useful growth tool.

Mergers are no panacea, however. Approximately one out of two fail because the promised synergies never materialise.

Synergies are often overestimated; their cost and time to implement underestimated. For example, making information systems compatible or restructuring staff can be notoriously difficult.

Numerous research works have measured the value created by M&A deals and how this value is shared between shareholders of the buyer and of the target. They demonstrate that value is created for the target's shareholders because of the control premium paid. For the buyer's shareholders, the results are more mixed, even if they tend to show a recent improvement since the beginning of the 2000s, when it was widely assumed that two-thirds of mergers were failing. Excluding some resounding failures (acquisition of Alstom's energy division by GE or the Monsanto by Bayer), which heavily bias the results, M&A deals would appear value-creative because of some largely successful deals such as Sanofi/Genzyme, Office Depot-OfficeMax, Peugeot-Opel. Quality and speediness of the integration process are the key factors for successful M&A deals.

Section 45.2 CHOOSING A NEGOTIATING STRATEGY

A negotiating strategy aims at achieving a price objective set in accordance with the financial value derived from our valuation work presented in Chapter 31. But price is not everything. The seller might also want to limit the guarantees they grant, retain managerial control, ensure that their employees' future is safe, etc.

Depending on the number of potential acquirers, the necessary degree of confidentiality, the timing and the seller's demands, there is a wide range of possible negotiating strategies. We present below the two extremes: private negotiation and auction. Academic researchers[2] have established that none of these strategies is better than another. Our personal experience tells us the same thing: the context dictates the choice of a strategy.

1/ PRIVATE NEGOTIATION

The seller or their advisor contacts a small number of potential acquirers to gauge their interest. After signing a confidentiality agreement (or non-disclosure agreement, NDA), the potential acquirers might receive an information memorandum describing the company's industrial, financial and human resource elements. Discussions then begin. It is important that each potential acquirer believes they are not alone, even if in reality they are. In principle, this technique requires extreme confidentiality. Psychological rather than practical barriers to the transaction necessitate the high degree of confidentiality.

To preserve confidentiality, the seller often prefers to hire a specialist, most often an investment banker, to find potential acquirers and keep all discussions under wraps. Such specialists are usually paid a success fee that can be proportional to the size of the transaction. Strictly speaking, there are no typical negotiating procedures. Every transaction is different. The only absolute rule about negotiating strategies is that the negotiator must have a strategy.

> The advantage of private negotiation is a high level of confidentiality.

The discussion focuses on:

how much control the seller will give up (and the status of any remaining minority shareholders);

the price;

the payment terms;

any conditions precedent;

representations and warranties; and

any contractual relationship that might remain between the seller and the target company after the transaction.

As you might expect, price remains the essential question in the negotiating process. Everything that might have been said during the course of the negotiations falls away, leaving one all-important parameter: price. We now take a look at the various agreements and clauses that play a role in private negotiation.

(a) Memorandum of understanding (MOU) or letter of intent (LOI)

When a framework for the negotiations has been defined, a memorandum of understanding is often signed to open the way to a transaction. A memorandum of understanding is a moral, not a legal, commitment. Often, once the MOU is signed, the management of the acquiring company presents it to its board of directors to obtain permission to pursue the negotiations.

The MOU is not useful when each party has made a firm commitment to negotiate. In this case, the negotiation of the MOU slows down the process rather than accelerating it.

(b) Agreement in principle

The next step might be an agreement in principle, spelling out the terms and conditions of the sale. The commitments of each party are irrevocable, unless there are conditions precedent – such as approval of the regulatory authorities. The agreement in principle can take many forms.

(c) Financial sweeteners

In many cases, specific financial arrangements are needed to get over psychological, tax, legal or financial barriers. These arrangements do not change the value of the company.

> These arrangements cannot transform a bad transaction into a good one. They serve only to bring the parties to the transaction closer together.

Sometimes, for psychological reasons, the seller refuses to go below some purely symbolic value. If they draw a line in the sand at 200, for example, whereas the buyer does not want to pay more than 190, a schedule spreading out payments over time sometimes does the trick. The seller will receive 100 this year and 100 next year. This is 190.9 if discounted at 10%, but it is still 200 to their way of thinking. Recognise that we are out of the realm of finance here and into the confines of psychology, and that this arrangement fools only those who want to be fooled.

This type of financial arrangement is window-dressing to hide the real price. Often companies build elaborate structures in the early stages of negotiation, only to simplify them little by little as they get used to the idea of buying or selling the company. Far from being a magical solution, such sweeteners give each party time to gravitate towards the other. In these cases it is only a stage, albeit a necessary one.

The following techniques are part of the investment banker's stock in trade:

set up a special-purpose holding company to buy the company, lever up the company with debt, then have the seller reinvest part of the funds in the hope of obtaining a second gain (this is an LBO,[3] see Chapter 47);

have the buyer pay for part of the purchase price in shares, which can then be sold in the market if the buyer's shares are listed;

pay for part of the purchase price with IOUs;

link part of the purchase price to the sale price of a non-strategic asset the buyer does not wish to keep, or on the outcome of a significant ongoing litigation;

an earnout clause, which links part of the transaction price to the acquired company's future financial performance. The clause can take one of two forms:

- either the buyer takes full control of the target company at a minimum price, which can only be revised upwards; or
- the buyer buys a portion of the company at a fixed price and the rest at a future date, with the price dependent on the company's future profits. The index can be a multiple of EBIT, EBITDA or pre-tax profit.

Earnout provisions are very common in transactions involving service companies (advertising agencies, M&A boutiques), where people are key assets. Deferral of part of the price will entice them to stay and facilitate the integration process, although it can create management problems during the earnout period.

2/ AUCTION

In an auction, the company is offered for sale under a predetermined schedule to several potential buyers who are competing with each other. The objective is to choose the one offering the highest price. An auction is often private, but it can also be announced in the press or by a court decision.

Private auctions are run by an investment bank in the following manner. Once the decision is taken to sell the company, the seller often asks an audit firm to produce a vendor due diligence (VDD, also called a long form report) to provide a clear view of the weak points of the asset from legal, tax, accounting, environmental,

strategic and regulatory points of view. The VDD will be communicated to buyers later on in the process. For the moment, a brief summary of the company is prepared (a “teaser”). It is sent, together with a NDA, to a large number of potentially interested companies and financial investors.

In the next stage (often called “Phase I”), once the potential buyers sign the non-disclosure agreement,[4] they receive additional information, gathered in an information memorandum (“info memo”). Then they submit a non-binding offer indicating the price, its financing, any conditions precedent and eventually their intentions regarding the future strategy for the target company.

At that point of time (“Phase II”), a “short list” of up to half a dozen candidates at most is drawn up by the seller and their advisor on the basis of price, other sales conditions, and their confidence in the capability and willingness of the candidates to successfully conclude the sale. Selected buyers receive still more information and possibly a schedule of visits to the company's industrial sites and meetings with management. Often an electronic **data room** is set up, where all economic, financial, regulatory, environmental and legal information concerning the target company is available for perusal. Access to the data room is very restricted; for example, no copies can be made. At the end of this stage, potential investors submit binding offers.

At any time, the seller can decide to enter into **exclusive negotiations** for a few days or a few weeks. For a given period of time, the potential buyer is the only candidate. At the end of the exclusive period, the buyer must submit a binding offer (in excess of a certain figure) or withdraw from the negotiations. Exclusivity is usually granted on the basis of a pre-emptive offer, i.e. a financially attractive proposal.

Together with the binding offers, the seller will ask the bidder(s) to propose a markup (comments) to the disposal agreement (called the share purchase agreement, SPA)[5] previously provided by the seller. The ultimate selection of the buyer depends, naturally, on the binding offer, but also on the buyer's comments on the share purchase.

The seller selecting an auction process to dispose of the company may believe that it will lead to a high price because buyers are in competition with each other. In addition, it makes it easier for the seller's representatives to prove that they did everything in their power to obtain the highest possible price for the company, be it:

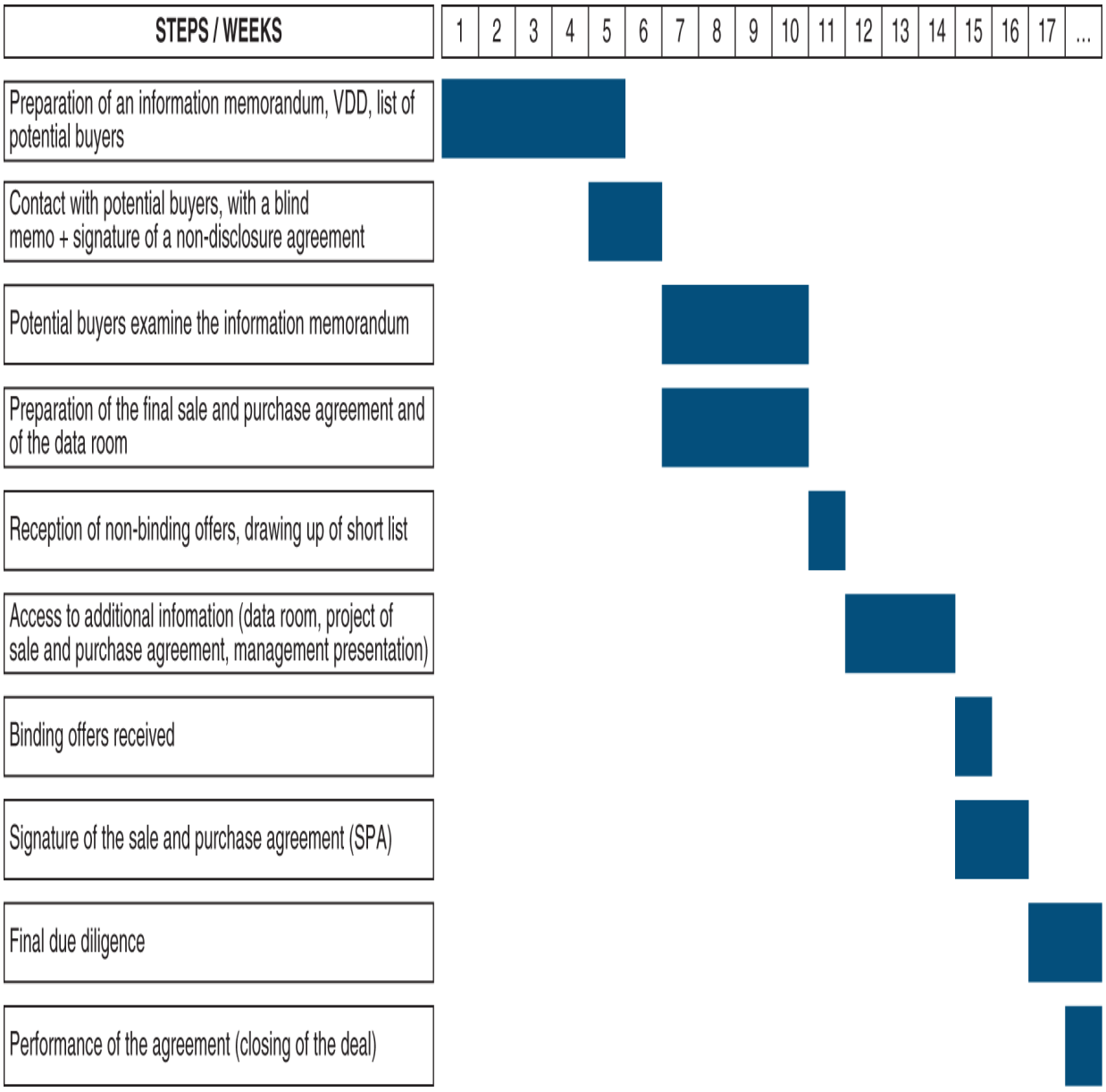
the executive who wants to sell a subsidiary;

a majority shareholder whose actions might be challenged by minority shareholders; or

the investment banker in charge of the transaction.

Competition sometimes generates a price that is well in excess of expectations. Moreover, an auction is faster, because the seller, not the buyer, sets the pace.

However, the auction creates confidentiality problems. Many people have access to the basic data, and denying rumours of a transaction becomes difficult, so the process must move quickly. Also, as the technique is based on price only, it is exposed to some risks, such as several potential buyers teaming up with the intention of splitting the assets among them. Lastly, should the process fail, the company's credibility will suffer. The company must have an uncontested strategic value and be in sound financial condition. The worst result is that of an auction process which turns sour because financial results are not up to the estimations produced a few weeks before, leaving only one buyer who knows they are now the only buyer.



A well-processed auction can take three to five months between intention to sell and the closing. It is sometimes shorter when an investment fund sells on to another fund.

3/ THE OUTCOME OF NEGOTIATIONS

In the end, whatever negotiating method was used, the seller is left with a single potential buyer who can then impose certain conditions. Should the negotiations fall apart at this stage, it could spell trouble for the seller because they would have to go back to the other potential buyers, hat in hand. So the seller is in a position of weakness when it comes to finalising the negotiations. The principal remaining element is the representations and warranties provisions that are part of the share purchase agreement.

Representations and warranties (“reps & warranties”) are particularly important because they give confidence to the buyer that the profitability of the company has not been misrepresented. It is a way of securing the value of assets and liabilities of the target company as the contract does not provide a detailed valuation.

Representations and warranties are not intended to protect the buyer against an overvaluation of the company. They are intended to certify that **all of the means of production are indeed under the company's**

control, that the financial statements have been drawn up in accordance with accounting principles and that there are no hidden liabilities.

Well-worded representations and warranties clauses should guarantee to the buyer:

the substance of fixed assets (and not their value);

the real nature and the value of inventories (assuming that the buyer and the seller have agreed on a valuation method);

the real nature of other elements of working capital;

the amount and nature of all of the company's other commitments, whether they are on the balance sheet (such as debts) or not.

They also facilitate the sharing of known risks within the company at the time of the sale (disputes, defaulting customers) between buyer and seller.

The representations and warranties clause is generally divided into two parts.

In the first part (representations), the seller makes commitments related to the **substance** of the company that is to be sold.

The seller generally represents that the target company and its subsidiaries are properly registered, that all the fixed assets on the balance sheet, including brands and patents, or used by the company in the ordinary course of business, actually exist. As such, representations and warranties do not guarantee the book value of the fixed assets, but their existence.

The seller represents that inventories have been booked correctly, and that depreciation and provisions have been calculated according to GAAP.[6] The seller declares that the company is up to date in tax payments, salaries and other accruals and that there are no prejudicial contracts with suppliers, customers or employees. All elements already communicated to the buyer, in particular exceptional items such as special contracts, guarantees, etc., are annexed to the clause and excluded from it because the buyer is already aware of them.

Lastly, the seller represents that during the transitional period between the last statement date and the sale date the company was managed in a prudent manner. In particular, the seller certifies that no dividends were distributed or assets sold, except for those agreed with the buyer during the period, that no investments in excess of a certain amount were undertaken, nor contracts altered, etc.

This is known as the locked-box system, where the price is definitively set on the basis of the latest financial statements provided by the seller and reviewed by the buyer. Otherwise, the company's accounts will have to be closed at the time of sale and price adjustments will have to be made if the equity (or, to simplify the process, the net debt and working capital) recorded is different from that guaranteed by the seller.

In the second part of the clause (warranties), the selleragrees to cover any additional liabilities that were not disclosed to the buyer (which the buyer was unable to factor in when setting the price), that occurred prior to the sale and come to light after the sale, and to do so for a given period (usually three years). Thresholds and a predetermined cap are set. In some cases, it is possible to set off such liabilities against provisions which then fall away or against income from assets sold at a higher price than expected. Warranties are often accompanied by a holdback (part of the purchase price is put in an escrow account)[7] or a bank guarantee.

The representations and warranties clauses are the main addition to the sale agreement but, depending on the agreement, there may be many other additions, so long as they are legally valid – i.e. not contrary to company law, tax law or stock market regulations requiring equal treatment of all shareholders. A non-exhaustive list would include:

means of payment;

status and future role of managers and executives;

audit of the company's books. On this score, we recommend against performing an audit before the two parties have reached an agreement. An audit often detects problems in the company, poisoning the atmosphere, and can serve as a pretext to abandoning the transaction.

minority shareholders' agreement; etc.

Of course, the parties to the contracts should also call upon legal experts to ensure that each clause is legally enforceable.

The final step is the actual consummation of the deal. It often takes place at a later date, because certain conditions must be met first: accounting, legal or tax audit, restructuring, approval of domestic or foreign competition commissioners, etc.

Sometimes a link-up is not allowed for competition (anti-trust) reasons (Sainbury's–Asda merger in the UK, Alstom–Siemens in Europe) or control of foreign investments on companies considered as strategic (Carrefour–Alimentation Couche Tard, Broadcom–Qualcomm). Accordingly, these concerns must be anticipated very early on in the merger process and the parties must be assisted by specialised lawyers.

In Europe, the thresholds are €5bn for the combined sales of the parties and €250m for sales made on a combined basis in Europe by at least two parties. An exception exists when all companies concerned generate more than two thirds of their gross revenue within the EU, and within the same single country (the two-thirds rule).

Finally, in the USA, the Hart–Scott–Rodino law allows for notification to be waived if the value of the target is less than $92m. Many types of transactions are, nonetheless, exempted; for example, deals worth less than $368m between companies with sales of less than $184m, target's sales of less than $18.4m, etc.

4/ THE DUAL-TRACK PROCESS

In order to improve its negotiation position or because the likely outcome of the sale process is unclear, the seller may decide to pursue a dual-track process: it will launch a sale process and the preparation of an IPO in parallel. At the latest possible moment, it will choose to sell to the one offering the best price, be it the stock market or a buyer. This is why in 2018, Delachaux cancelled its IPO and replaced an investment fund (CVC) with a Canadian investor (CDPQ).

Section 45.3 TAKING OVER A LISTED COMPANY

The first idea that comes to mind when buying or taking a significant stake in a listed company would be to pick up shares on the stock market until you are strong enough to negotiate with the other shareholders and the management team. This solution seems attractive since it would allow you to take control without having to buy all the securities. This is why the law and the stock exchange authorities have imposed certain constraints on the purchase of securities on the stock exchange.

First of all, there is an obligation to declare the crossing of thresholds: when a shareholder exceeds a certain percentage of the capital or voting rights of a listed company, a disclosure obligation is imposed on them. Then there is an obligation to launch a public offer on all outstanding shares when certain thresholds are crossed.

These principles governing takeovers of listed companies are found in most countries with various degrees of constraint from one country to another.

1/ STAKE-BUILDING

To succeed in acquiring a listed company, the first step can be to start building a block in the company. This is how Vivendi acquired 30% of Gameloft before launching a full offer on the rest of the shares.

There are three methods available to investors seeking to accumulate shares:

gradually buying up shares on the market. Shares are purchased at the market price and the identity of sellers is generally unknown;

acquiring blocks of shares, which involves negotiating the purchase of large blocks of shares with identified sellers;

an equity swap or total return swap (TRS), which is a contract to swap the stock performance (dividends, capital gains and losses) between a bank (which pays the performance to the investor) and an investor (who wishes to take a risk on the performance of a share without holding it, and who pays interest to the bank) or the opposite. The bank hedges this operation by buying shares on the market. At the end of the swap term, the investor buys the bank's shares at the price paid by the latter. This is how Elliott acquired a 2% stake (in addition to the 3.75% stake it held in shares) in Telecom Italia in 2018.

The following conditions must be met for an acquisition of an attractive percentage at a reasonable price:

the share capital of the target company must be dispersed, with no controlling shareholder actually controlling the company;

the operation must be carried out in secret to avoid defensive measures being taken by shareholders opposed to the acquirer of the securities and to prevent the target's share price from soaring;

the volume of daily transactions in the security must be large enough to allow for large purchases without causing a market imbalance.

Sometimes the purchase of securities is made by several investors acting in concert (see below) and sometimes over a long period of time.

In order to prevent the acquirer from taking control of a company in that way, most market regulations require investors in a listed company to publicly declare when they pass certain thresholds in the capital of a company. If the acquirer fails to declare these shares, voting rights are lost.

The first threshold is most often 3% (UK, Switzerland, Spain, Germany, Italy, etc.).

Regulatory disclosure requirements allow minority shareholders to monitor stake-building and prevent an acquirer from getting control of a company little by little. These requirements are also helpful for the management to monitor the shareholder structure of the company. By-laws can set additional thresholds to be declared (generally lower thresholds than required by law).

Regulatory threshold disclosure requirements are the following:

China	5% and multiples of 5% above
France	5%, 10%, 15%, 20%, 25%, 30%, 33.3%, 50%, 66.6%, 90%, 95%
Germany	3%, 5%, 10%, 15%, 20%, 25%, 30%, 50%, 75%
India	5%, then 2% till 25%, then any share above 25%
Italy	3%, 5%, multiples of 5% above up to 30%, then 50%, 66.6%,90%,
Netherlands	3%, 5%, 10%, 15%, 20%, 25%, 30%, 40%, 50%, 60%, 75%, 95%
Spain	3%, 5%, multiples of 5% thereafter, then 50%, 60%, 70%, 75%, 80%, 90%
Switzerland	3%, 5%, 10%, 15%, 20%, 25%, 33.3%, 50%, 66.6%
UK	3% and multiples of 1% above
US	5% and multiples of 1% above

2/ TYPE OF OFFER

It is very unusual for an acquirer to gain control of a public company without launching a public offer on the target. Such offers are made to all shareholders over a certain period of time (2–10 weeks depending on the country). Public offers can be split between:

share offers or cash offers;

voluntary or mandatory offers;

hostile or recommended offers.

(a) Cash or share offers

The table below summarises the criteria relevant for assessing whether a bidder wants to propose shares or cash in a public offer:

	Payment in cash	Payment in shares	Comments
Allocation of synergies	Target company's shareholders benefit from synergies only via the premium they receive	Target company's shareholders participate in future synergies	In a friendly share exchange offer, the premium might be minimal if the expected synergies are high
Psychological effects	Cash lends credibility to the bid and increases its psychological value	Payment in shares has a “friendly” character	
Purchaser's financial structure	Increases gearing	Does not increase gearing	The size of the deal sometimes requires payment in shares
Shareholder structure	No impact unless the deal is subsequently refinanced through a share issue	Shareholders of the target become shareholders of the enlarged group	Sometimes, shareholders of the target get control of the new group in a share-for-share offer
Impact on purchaser's share price	After the impact of the announcement, no direct link between the purchaser's and target's share price	Immediate link between purchaser's and target's share price, maintained throughout the bid period	A share exchange offer gains credibility when the two companies' share prices align with the announced exchange ratio
Signal from buyer's point of view	Positive: buyer's stock is undervalued. Debt financing: positive signal	Negative: buyer's stock is overvalued	If the size of the target only makes possible a share-for-share deal, no signal

	Payment in cash	Payment in shares	Comments
Accounting effects	Increases EPS and its growth rate if the inverse of the target's P/E ratio including any premium is greater than the after-tax cost of debt of the acquirer	Increases EPS if the purchaser's P/E ratio is higher than the target's, premium included	EPS is not a relevant indicator of value creation, see Chapter 27
Purchaser's tax situation	Interest expense deductible	No impact, except capital gain if treasury shares are used	Taxation is not a determining factor
Seller's tax situation	Taxable gain	Gain on sale can be carried forward	
Index weighting	No change	Higher weighting in index (greater market capitalisation)	In the case of a share exchange, possible re-rating owing to size effect

In practice, the choice is not so black and white. The purchaser can offer a combination of cash and shares (mixed offers), cash as an alternative to shares, or launch a “mix and match” offer, as we will see.

(b) Hostile or recommended offers

The success or failure of an offer can depend largely on the attitude of the target's management and the board of directors towards the offer.

To maximise the chances of success, the terms of an offer are generally negotiated with the management prior to the announcement, and then recommended by the board of the company. The offer is then qualified as friendly or recommended.

In some cases, the management of the target is not aware of the launch of an offer; it is then called an unsolicited offer. Facing this sudden event, the board has to convene and decide whether the offer is acceptable or not. If the board rejects the offer, it becomes hostile. This does not mean that the offer will not succeed, but just that the bidder will have to fight management and the current board of directors during the offer period to convince shareholders.

Most unsolicited offers end up as recommended offers, but only after the bidder has sweetened the offer in one way or another (generally by offering a higher price).

Around 15% of offers are deemed hostile and large groups such as Pfizer, Sanofi, Diageo, Enel, etc. were created through unsolicited offers.

(c) Voluntary or mandatory offers

The concept of the mandatory offer does not exist in every country. Nevertheless, in most countries, when a buyer passes a certain threshold or acquires the control of the target, they are required by stock exchange regulation to offer to buy back all the shareholders' shares. It is one of the founding rules of stock exchange regulations. It should be noted that in the US, there is no mandatory offer and an acquirer can theoretically buy a majority of the capital of a listed company without having to launch an offer to the minority shareholders.

Generally, the constraints for a mandatory offer are tighter than for a voluntary offer. For example, in the UK the mandatory offer will be in cash, or at least a cash alternative will be provided. Obviously, the conditions of the offer that the acquirer is allowed to set in a mandatory offer are limited because they are defined by the regulations.

3/ CERTAINTY OF THE OFFER

It would be very disruptive for the market if an acquirer were to launch an offer and withdraw it a few days later. All market regulations try to ensure that when a public offer is launched, shareholders are actually

given the opportunity to tender their shares.

Therefore, market regulation requires that a cash offer is fully funded when it is launched. Full funding ensures that the market does not run the risk of a buyer falling short of financing when the offer is a success! This funding usually takes the form of a guarantee by a bank (generally the bank presenting the offer commits that if the acquirer does not have the funds the bank will pay for the shares).

Another principle is that offers should be unconditional. In particular, the bidder cannot set conditions to the execution of the offer that remains in their hands (as an example, an offer cannot be conditional upon board approval of the acquirer). Nevertheless, in most countries, the offer can be subject to a minimum acceptance (which generally cannot be too high) and regulatory approval (including antitrust). In a few countries (the UK, the Netherlands, the US), the offer can be subject to a material adverse change (MAC) clause, which can only be invoked in extreme cases.[8]

4/ DOCUMENTATION AND MARKET AUTHORITY ROLE

The main role of market authorities is to guarantee the equal treatment of all shareholders and the transparency of the process.

In that regard, market authorities will have a key role in public offers:

They set (and often control) the standard content of the offer document. This document must contain all relevant information allowing the target's shareholders to take a proper decision.

They supervise the process timetable.

In most countries their green light is necessary for the launch of the offer (they therefore control the price offered).

5/ DEFENSIVE MEASURES

In theory, a company whose shares are being secretly bought up on the stock market generally has a greater variety and number of defensive measures available to it than a company that is the target of a takeover bid. The reason behind this disparity is the secrecy surrounding shares bought up on the market compared with rules of equality and transparency applied to takeover bids.

If a company becomes aware that its shares are being bought up on the market, it is entitled to invoke all of the means of shareholder control described in Chapter 41. It can also get “friendly” investors to buy up its shares in order to increase the percentage of shares held by “friends” and push up its share price, thus making it more expensive for the hostile party to buy as many shares as it needs. Of course, the company will also need to have the time required to carry out all of these transactions, which generally involve waiting periods.

In the case of a takeover bid, there are fewer defensive measures available and they also depend on regulations in force in each country. In some countries (the UK and the Netherlands), all defensive measures taken during a takeover period (excluding attempts to identify other bidders) must be ratified by an EGM held during the offer period. Proxies granted by the general meeting of shareholders to the board prior to the offer period may be suspended. In some countries, any decision taken by the corporate and management bodies before the offer period that has not been fully or partially implemented, which does not fall within the normal course of business and which is likely to cause the offer to fail, must be approved or confirmed by the general meeting of the target's shareholders.

Furthermore, in some countries, as soon as the takeover bid has been launched, the parties involved are required to ensure that the interests of the target's employees are taken into account, to ensure that all shareholders are treated equally and that no upheaval on the stock markets is caused, to act in good faith and to comply with all regulations governing takeover bids.

> Generally, a company has limited means for defending itself against takeover bids.

The target company can either defend itself by embarking on an information campaign, explaining to shareholders and to the media how it will be able to create greater value in the future than the premium being offered by the predator, or it can use more active defensive measures, such as:

finding a third party ready to launch a competing takeover bid, called a “white knight”;

launching its own takeover bid on the hostile bidder;

getting “friends” to buy up its shares;

carrying out a capital increase or buying or selling businesses;

warrants;

legal action.

Just how far a board of directors is prepared to go to sabotage a takeover bid is determined by each board facing a predator. It could be depriving its shareholders of a potential capital gain and shareholders may question the responsibility of directors.

A competing takeover bid must be filed a few days before the close of the initial bid. The price offered should be at least a few percentage points higher than the initial bid. There is always the possibility that the initial bidder will make a higher bid, so there is no guarantee that the competing offer will succeed. Likewise, the “**white knight**” can sometimes turn grey or black when the rescue offer actually succeeds. We saw this in 2019 when Thales came to the “rescue” of Gemalto which was “under attack” by Atos.

A share purchase or exchange offer by the target on the hostile bidder, known as a Pac-Man defence, is only possible if the hostile bidder itself is listed and if its shares are widely held. In such cases, industrial projects are not that different given that an offer by X on Y results in the same economic whole as an offer by Y on X. This marks the start of a communications war (advertisements, press releases, meetings with investors), with each camp explaining why it would be better placed to manage the new whole than the other.

The buying up of shares by “friends” is often highly regulated and generally has to be declared to the market authority, which monitors any acting in concert or which may force the “friend” to file a counter-offer!

A capital increase or the issue of marketable securities is often only possible if this has been authorised by the general meeting of shareholders prior to the takeover bid, because generally there won't be enough time to convene an EGM to fit in with the offer timetable. In any event, a reserved issue is often not allowed.

Warrants, described in Chapter 41, are a strong dissuasive element. The negative consequences of warrants being issued for the company launching a hostile takeover bid mean that it is generally prepared to negotiate with the target – neutralisation of the warrants in exchange for a higher offer price.

US experience has shown that “poison pill” warrants strengthen the negotiating position of the target's management, although they don't ensure its independence. If warrants are, in fact, issued, then the matter of director responsibility will be raised, since the directors will effectively have caused shareholders to lose out on an opportunity to get a higher price for their shares.

The **transfer of an important asset** into a special structure to prevent its disposal. This is the method used by Suez to try to fend off the Veolia bid.

Legal action could be taken to ensure that market regulations are complied with or on the basis of misleading information if the prospectus issued by the hostile bidder appears to criticise the target's management. There is also the possibility of reporting the hostile bidder for abuse of a dominant position or insider trading if unusual trades are made before the offer is launched, for failing to comply with the principle of equality of shareholders or for failing to protect the interests of employees if the target has made risky acquisitions during the offer period. The real aim of any legal proceedings is to gain time for the target's management given that, in general, it takes a few months or quarters for the courts to issue rulings on the facts of a case.

6/ THE LARGER CONTEXT

The various anti-takeover measures generally force the bidder to sweeten their offer, but rarely to abandon it. What can happen is that an initially hostile bid can turn into a friendly merger (SABMiller/AB Inbev, Veolia-Suez). Whether a hostile offer is successful or a white knight comes to the rescue, events invariably lead to the loss of the target company's independence.

Which, then, are the most effective defensive measures? In recent bids involving large companies, those that have taken the initiative far upstream have been at a clear advantage. A good defence involves ensuring that the company is always in a position to seize opportunities, to anticipate danger and to operate from a position of strength so as to be able to counterattack if need be.

> In our view, loyal shareholders can be the best defence. What makes them loyal? Good financial performance, candid financial communication, a share price that reflects the company's value and skilled managers who respect the principles of shareholder value and corporate governance.

7/ SUMMARY OF SOME NATIONAL REGULATIONS

The EU directive on public offers lays down the principle that a shareholder who has assumed effective control over a company must bid for all equity-linked securities. It is up to individual countries to set a threshold of voting rights that constitutes effective control.

The directive states very specifically the floor price of a mandatory bid: the highest price paid by the new controlling shareholder in the 6–12 months prior to the bid (the exact period is set by national regulations). A mandatory bid can be in either cash or shares (if the shares are listed and are liquid).

So far as defence tactics are concerned, the European directive left European states free to:

ban or not ban the boards of target companies from taking anti-takeover defensive measures during the bid, such as poison pills, massive issuing of shares, etc., without approval from an extraordinary general meeting;

suspend or not suspend during an offer shareholders' agreements or articles of association limiting voting rights, transfers of shares, shares with multiple voting rights, rights of approval or of first refusal;

authorise targets to put in place anti-takeover measures without the approval of their shareholders if the buyer does not need similar approval from its own shareholders to put in place similar measures at its own level.

Multiple voting rights and/or restrictions on voting rights disappear as of the first general shareholders' meeting after a bid that has given a bidder a qualified majority of the company. This does not apply to golden shares that have been deemed compatible with European law.[9]

The table below summarises the principal rules applicable to takeover bids in some countries:

Country	Regulator	Threshold for mandatory bid	Minimum percentage mandatory bid must encompass	Bid conditions allowed?	Bid validity after approval	Squeeze-out[10] possible?

Country	Regulator	Threshold for mandatory bid	Minimum percentage mandatory bid must encompass	Bid conditions allowed?	Bid validity after approval	Squeeze-out[10] possible?
China	China Securities Regulatory Commission (www.csrc.gov.cn)	30%	5%		30-60 days	No. Minority shareholders have the right to sell to the buyer after an offer giving them at least 75% of shares, at the offer price
France	AMF, Autorité des Marchés Financiers (www.amf-france.org)	30% of shares or voting rights, 1% p.a. between 30% and 50% of shares or voting rights	100% of shares and equity-linked securities	Usual suspects.[12] None if bid mandatory	25–35 trading days	Yes, if >90% of voting rights and shares
Germany	BAFin, Bundesanstalt für Finanzdien-stle-istungsauf-sicht (www.bafin.de)	30% of voting rights	100%	Usual supects.[12] None if mandatory bid	4–10 weeks	Yes, if >95% of shares
India	Securities and Exchange Board of India (www.sebi.gov.in)	25% of shares or voting rights, 5% p.a. beyond, acquisition of control	26% at least	Minimum acceptance	20 days	Yes, if the higher of 90% of shares or stake of the controlling shareholder + 50% of the float is reached
Italy	CONSOB, Commissione Nazionale per le Società e la Borsa (www.consob.it)	25% or 30% of shares, 5% p.a. beyond 30% up to 50%	100% of voting shares	Usual suspects[12]	15–40 trading days	Yes, if >95% of voting rights

Country	Regulator	Threshold for mandatory bid	Minimum percentage mandatory bid must encompass	Bid conditions allowed?	Bid validity after approval	Squeeze-out[10] possible?
Netherlands	AFM, Autoriteit Financiele Markten (www.afm.nl)	30% of voting rights	100% of shares and equity-linked securities	Minimum acceptance	>8 trading weeks and <10 weeks	Yes, if >95% of shares
Spain	CNMV, Comisión Nacional del Mercado de Valores (www.cnmv.es)	30% and 50% or less if right to nominate more than half of the directors or any increase of 5% between 30% and 50%	100%	Usual suspects[12]	3–14 weeks	Yes, if >90% of the voting rights and higher than 90% success rate for the public offer
Switzerland	COPA, Commission des Offres Publiques d'Achat (www.takeover.ch)	33.33% of voting rights[11]	100% of shares	Usual suspects[12]	20–40 trading days	Yes, if >90% of voting rights
UK	Takeover Panel (www.thetakeoverpanel.org.uk)	30% of voting rights and any increase between 30% and 50%	100% of shares and all instruments convertible or exchangeable into shares	Usual suspects[12] and MAC clause that must be approved by regulator	21–60 trading days	Yes, if >90% of the shares[13]
USA	SEC, Securities and Exchange Commission (www.sec.gov)	None, except Maine (20%), Pennsylvania (25%) and South Dakota (50%)	None	Usual suspects[12] and MAC clause	>20 trading days	Yes with normal or super-majority

10 That is, possibility for the majority shareholder to force the buy-back of minority shareholders and delist the company if minority shareholders represent only a small part of the capital.

11 No threshold (opt-out) or a threshold up to 49% if the by-laws of the target company permit.

12 Minimum acceptance, antitrust authorisations, authorisation of shareholders to issue shares.

13 The Scheme of Arrangement allows for 75% to agree to an acquisition for it to go through.

SUMMARY

The summary of this chapter can be downloaded from www.vernimmen.com.

M&A deals tend to come in waves. Their determinants are macroeconomic (globalisation, deregulation, technological evolution), microeconomic (search for size, for new markets, gains of time), human (succession issues) or structural (liquidation of an investment fund).

The art of negotiation consists of allocating the value of the synergies expected from a merger or acquisition between the buyer and the seller. There are two basic methods of conducting the negotiations:

private negotiation, which preserves a high level of confidentiality, at the cost of having significant competition during the sales process;

a private auction, which heightens the competition between buyers, but is more restrictive for the seller.

Regardless of the chosen procedure, certain elements are common to every deal:

memorandums of understanding and agreements in principle serve to describe the general agreement found between the parties and are a milestone along the path to full commitment of the parties to the deal;

representations and warranties guarantee to the buyer that all of the means of production belong to the company and that there are no hidden liabilities; the seller certifies substantive aspects of the company and the amount of equity capital;

in some cases, earnout clauses link a portion of the purchase price to the company's future profits;

the final outcome of negotiations is the signing of a share purchase agreement.

Stake-building can be the first step to acquiring control over a listed company. But it can be slow and faces the requirement of declaring the crossing of ownership and voting rights thresholds.

A public offer is the usual way to acquire a listed company. It is based on two fundamental principles: transparency and equal treatment of shareholders. It can be in cash or in shares, hostile or friendly, voluntary or mandatory.

In each country, the acquisition of listed companies is conducted under the supervision of a stock-market watchdog. A directive harmonises the main principles of takeover bids in the European Union.

QUESTIONS

1/What are the advantages and drawbacks of private negotiation?

2/What are the advantages and drawbacks of a private sale by auction?

3/What is the advantage of a public purchase or share exchange offer for a minority shareholder?

4/What advantages does a public offer have for the acquirer over an acquisition on the market? What are the drawbacks?

5/Can a company make an offer to buy another company that is for sale without having any real intention of closing the deal? Why? What protection is there for the seller?

6/What will be key to making an M&A deal a successful event in a company's history?

7/Why are earnout clauses so popular with companies in the service sector?

8/All things being equal, what is the downside of a deal being kept highly confidential?

9/When is it a good idea to go for a private auction?

10/How can a buyer be protected against any hidden liabilities and debts that the target may have?

11/What is the purpose of representations and warranties? What are the limits of such clauses?

12/What is the logical result of a successful hostile stake-building on the market?

13/What concern of market authorities is addressed by a suspension of trading after notice of an offer has been filed?

14/Why are defence mechanisms against hostile takeover bids very strictly regulated?

15/On the basis of financial theory, how can the role of an investment bank in a deal be summarised?

More questions are waiting for you at www.vernimmen.com.

ANSWERS

Questions

1/*Advantage: negotiations are kept confidential. Drawback: potential candidates may be left out.*

2/*Advantage: organisation of a market. Drawback: lack of confidentiality.*

3/*The minority shareholder is protected as they will be able to sell their shares at the same price as the majority shareholder.*

4/*The acquirer does not cause the share price to rise. The drawback is that if a stock market battle unfolds, they will not be in such a good position.*

5/*Yes. To obtain information. Memorandums of understanding and of agreement, confidentiality agreements.*

6/*The integration process post-acquisition.*

7/*The deal itself can have an unpredictable impact on human resources – the company's main assets.*

8/*The sale price might be lower.*

9/*When the business for sale is very profitable, and attractive to both trade buyers and financial investors.*

10/*Representation and warranties.*

11/*They provide a guarantee for the assets and liabilities of the company. Under no circumstances can such clauses guarantee the fairness of the price paid for the business.*

12/*A takeover bid.*

13/*The fair and equal dissemination of information.*

14/*Anti-takeover measures can deprive shareholders of the capital gains that come out of the free process of auctions.*

15/*Management of information asymmetry.*

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NOTES

1 *This is known as the ZOPA (zone of possible agreement).*

2 *See Boone and Mulherin (2007).*

3 *Leveraged buyout.*

4 *Implying they will use the information disclosed during the selling process only to make an offer and will not tell a third party they are studying this acquisition.*

5 *Or sale and purchase agreement.*

6 *Generally Accepted Accounting Principles.*

7 *A special bank account for the deposit of funds, to which the beneficiary's access is subject to the fulfilment of certain conditions.*

8 *In a UK takeover bid situation, 9/11 was not deemed to be such a case*.

9 *European law strictly limits national government leeway on golden shares. Golden shares are nonetheless still possible in some sectors and special cases, such as the defence industry*.

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Chapter 46
MERGERS AND DEMERGERS

When the financial manager celebrates a wedding (*or a divorce!)*

At first glance, this chapter might seem to repeat the previous ones in that selling a company almost always leads to linking it up with another. In everyday language we often talk of the merger of two companies, when in reality one company typically takes control of the other, using the methods described in Chapter 45. In fact, all that we have previously said about synergies and company valuations will be used in this chapter. **The only fundamental difference we introduce here is that 100% of the seller's consideration will be in shares of the acquiring company and not in cash.**

In addition, because markets nowadays prefer “pure-play” companies, demergers have come back into fashion. We will take a look at them in Section 46.3.

Section 46.1 ALL-SHARE DEALS

In this section, we will examine the general case of two separate companies that decide to pool their operations and redistribute roles. Before the business combination can be consummated, questions of valuation and power-sharing among the shareholders of the new entity must be resolved. Financially, the essential distinguishing feature among mergers and acquisitions is the nature of the consideration paid: 100% cash, a combination of cash and shares or 100% shares. Our discussion will focus on the last of these forms. Finally, we will not address the case of a company that merges with an already wholly owned subsidiary, which raises only accounting, tax and legal issues and no financial issues.

1/ THE DIFFERENT TECHNIQUES

(a) Legal merger

A legal merger is a transaction by which two or more companies combine to form a single legal entity. In most cases, one company absorbs the other. The shareholders of the acquired company become shareholders of the acquiring company and the acquired company ceases to exist as a separate legal entity.

> A legal merger is a combination of the assets and liabilities of two or more companies into a single legal entity.

From legal and tax points of view, this type of business combination is treated as a contribution of assets and liabilities, paid in new shares issued to the ex-shareholders of the acquired company.

(b) Contribution of shares

Consider the shareholders of Companies A and B. Shareholders of Company B, be they individuals or legal entities, can enter into a deal with Company A wherein they **exchange their shares** of B for shares of A. In this case, Companies A and B continue to exist, with B becoming a subsidiary of A and the shareholders of B becoming shareholders of A.

Financially and economically, the transaction is very close to the sale of all or part of Company B funded by an equivalent issue of new Company A shares, reserved for the shareholders of Company B.

For listed companies, the most common approach for achieving this result is a share exchange offer, as described in Section 45.3.

(c) Asset contribution

In a **contribution** (or transfer) **of assets**, Company B contributes a portion (or sometimes all) of its assets (and liabilities) to Company A in return for shares issued by Company A.

In a legal merger, the shareholders of Company B receive shares of Company A. In a transfer of assets, however, Company B, not the shareholders thereof, receives the shares of Company A. The position of Company B shareholders is therefore substantially different, depending on whether the transaction is a legal merger or a simple transfer of assets. In the transfer of assets, Company B remains and becomes a shareholder of Company A. Shareholders of B do not become direct shareholders of A. In the legal merger, shareholders of B become direct shareholders of A.

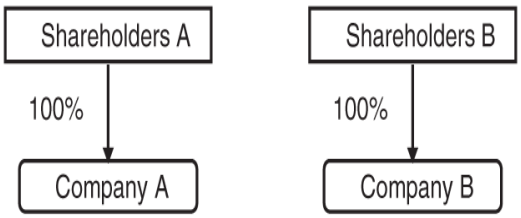
If Company B contributes all of its assets to A, B becomes a holding company and, depending on the amount of the assets it has contributed, can take control of A. This procedure is often used in corporate restructurings to transfer certain activities to subsidiaries.

Economically, there is no difference between these transactions. The group created by bringing together A and B is economically identical regardless of how the business combination is effected.

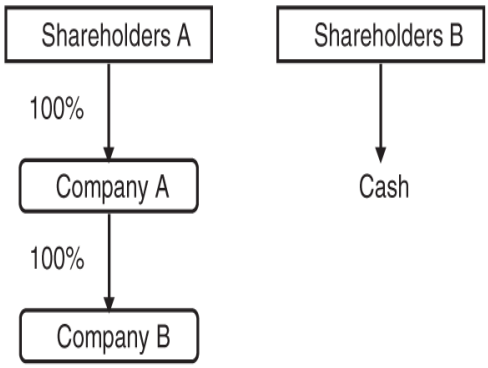
As an example of asset contribution, you can have a look at the EssilorLuxottica transaction in 2017. Delfin, controlled by Leonardo Del Vecchio, contributed its 61% stake in Luxottica to Essilor in exchange for 31% of the new EssilorLuxottica.

Structures for business combinations

Prior to transaction

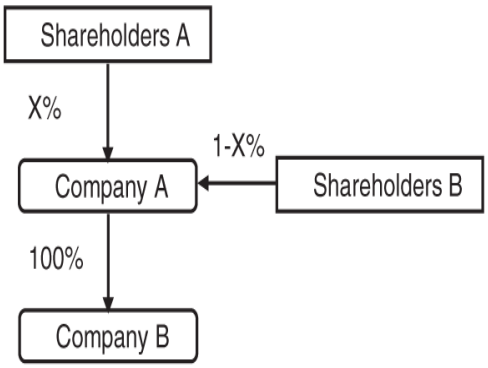


1 - A acquires B for cash



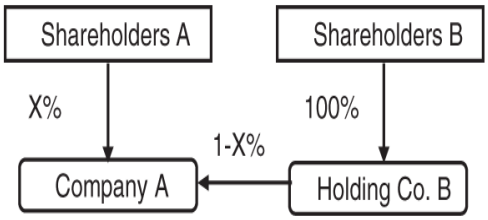
A buys B, A's equity remains unchanged

2 - A issues new shares in exchange for B shares



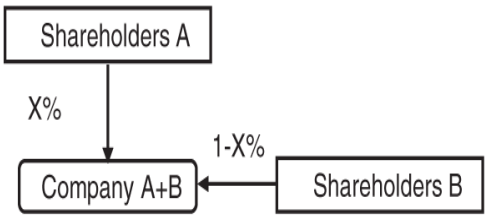
A's equity rises by an amount equal to the value of B's equity, but B continue to exist

3 - A issues new shares in exchange for assets and liabilities of B



B transfers its assets and liabilities to A. A's equity rises by an amount equal to the value of B's equity. The shareholders of B remain shareholders of B, which is now a holding company

4 - A issues new shares in exchange for B shares and B dissolves



B ceases to exist. A's equity rises by an amount equal to the value of B's equity

Economically speaking, there is no distinction between these different transactions: the group formed by the merger of companies A and B is economically identical regardless of the form it takes. In examples 2, 3, and 4, the shareholders of A and B are directly or indirectly shareholders in the new group.

2/ ANALYSIS OF THE DIFFERENT TECHNIQUES

For simplicity's sake, we will assume that the shares of both companies are fairly priced and that the merger does not create any industrial or commercial synergies. Consequently, there is no value creation as a result of the merger.

(a) From the point of view of the company

Companies A and B have the following characteristics:

(€m)	Enterprise value	Value of shareholders' equity agreed in the merger
Company A	900	450
Company B	500	375

Depending on the method used, the post-transaction situation is as follows:

(€m)	A acquires B shares for cash[1]	A merges with B	A issues new shares in exchange for B shares and B becomes a 100% subsidiary of A	A issues new shares in exchange for assets and liabilities of B
Value of A's new capital employed (now A + B)	1,400	1,400	1,400	1,400

(€m)	A acquires B shares for cash[1]	A merges with B	A issues new shares in exchange for B shares and B becomes a 100% subsidiary of A	A issues new shares in exchange for assets and liabilities of B
Value of A's shareholders' equity	450	825	825	825
Percentage of A held by A shareholders	100%	54.5%	54.5%	54.5%
Percentage of A held by B shareholders	—	45.5%	45.5%	45.5%[2]

Enterprise value and consolidated operating income are the same in each scenario. Economically, each transaction represents the same business combination of Companies A and B. It can be noted that when the target is a listed company, a 100% successful share exchange offer is financially equivalent to a legal merger.

Financially, however, the situation is very different, even putting aside accounting issues. If A pays for the acquisition in shares, then the shareholders' equity of A is increased by the shareholders' equity of B. If A purchases B for cash, then the value of A's shareholders' equity does not increase.

We reiterate that our reasoning here is strictly arithmetic and we are not taking into account any impact the transaction may have on the value of the two companies. If the two companies were already correctly priced before the transaction and there are no synergies, their value will remain the same. If not, there will be a change in value. **The financial mechanics (sale, merger, etc.) have no impact on the economics of a business combination. This is self-evident, but it is worth recalling.**

From the point of view of the acquiring company, the only difference between a share exchange and a cash acquisition is in the financial clout of the new group, i.e. its shareholders' equity.

An acquisition paid for in cash does not increase a group's financial clout, but an all-share transaction creates a group with financial means, which tends to be the sum of that of the two constituent companies.

(b) From the point of view of shareholders

A cash acquisition changes the portfolio of the acquired company's shareholders, because they now hold cash in place of the shares they previously held. It does not change the portfolio of the acquiring company's shareholders, nor their stake in the company.

An **all-share transaction** is symmetrical for the shareholders of A and B. No one receives any cash. When the dust settles, they all hold claims on a new company born out of the two previous companies. Note that their claims on the merged company would have been exactly the same if B had absorbed A. In fact, who absorbs whom is not so important; it is the percentage ownership the shareholders end up with that is important. Moreover, it is common for one company to take control of another by letting itself be “absorbed” by its smaller “target”.

Merger synergies are not shared in the same way. In a cash acquisition, selling shareholders pocket a portion of the value of synergies immediately (depending on the outcome of the negotiation). The selling shareholders do not bear any risk of implementation of the synergies. In an all-share transaction, however, the value creation (or destruction) of combining the two businesses will be shared according to the relative values negotiated by the two sets of shareholders.

In a cash acquisition, shareholders of the acquiring company alone assume the execution risks of the combination. In an all-share transaction, the risks are shared by the two groups of shareholders.

For the shareholders of Company B, **a contribution of shares**, with B remaining a subsidiary of A, has the same effect as a legal merger of the two companies. An **asset contribution** of Company B to Company A is also very similar to a legal merger. The only difference is that, in an asset contribution, the claim of Company B's ex-shareholders on Company A is via Company B, which becomes a holding company of Company A.

3/ PROS AND CONS OF PAYING IN SHARES

In contrast to a cash acquisition, there is no cash outflow in an all-share deal, be it an exchange of shares, an asset contribution in return for shares or a demerger with a distribution of shares in a new company. The transaction does not generate any cash that can be used by shareholders of the acquired company to pay capital gains taxes. For this reason, it is important for these transactions to be treated as “tax-free”.

What is the advantage of paying in shares? Sometimes company managers want to change the ownership structure of the company so as to dilute an unwelcome shareholder's stake, constitute a group of core shareholders or increase their power by increasing the company's size or prestige. More importantly, paying in shares enables the company to skirt the question of financing and merge even with very large companies. Some critics say that companies paying in shares are paying for their acquisitions with “funny money”; we think that depends on the post-merger ownership structure and share liquidity. Most importantly, it depends on the ability of the merged company to harness anticipated synergies and create value. In Section 45.3, we provide a table setting out the pros and cons of payment in shares versus cash.

Section 46.2 THE MECHANICS OF ALL-SHARE TRANSACTIONS

1/ EXCHANGE RATIO AND RELATIVE VALUE RATIO

To carry out a merger, you need to determine the **exchange ratio**, i.e. the ratio of the number of shares of one company to be issued for each share of the other company received.

When both companies have similar activities, the ratios of their earnings per share, cash flow per share, dividend per share, book equity per share, shares prices (when they are listed) are computed. Some even compute ratios of sales per share, EBITDA per share, EBIT per share. This is relevant only if the capital structures of both companies are similar.

When companies have dissimilar activities, like a diversified group and a one-product group or a holding company and an industrial group, then a full valuation of the two companies to be merged is generally performed according to the methods described in Chapter 31. Such a valuation is usually done on a standalone basis, no synergy being taken into account. As far as possible, the same valuation methods should be used to value each company and compute a parity per method.

Let us take another look at Companies A and B, with the following key figures:

	Earnings per share	Share price	Dividend per share
A (acquirer)	€3.33	€100	€1
B (acquiree)	€9.33	€176	€2.3
Exchange ratio	2.80	1.76	2.30

The final exchange ratio agreed upon may be 2.

Let's now move from the per-share level, which has allowed us to compute the exchange ratio, to the level of shareholders' equity value agreed in the merger. The ratio of shareholders' equity value of Company A to shareholders' equity value of Company B is called the relative value. A relative value of 0.8333 (B's value, 375, being equal to 0.833 A's value, 450) gives to the current B shareholders a stake of 0.833 / (0.833 + 1) =

45.5% in the merged entity. Hence, A shareholders will get a stake of 1 / (0.8333 + 1) = 54.5%. 0.833 corresponds to the ratio of the values of shareholders' equity agreed in the merger, €450m and €375m, respectively.

If the relative value ratio agreed in the merger had been 0.9, A shareholders would have obtained a stake of 52.6% in the merger entity and B shareholders a stake of 47.4%.

> The relative value agreed between the two companies determines who will own how much of the new company. As a result, this ratio will define the power each shareholder will wield after the transaction.

Once relative values are determined, calculating the exchange ratio is a simple matter:

$$\text{Exchange ratio} = \text{Relative value ratio} \times \frac{\text{Pre-merger number of } A \text{ shares}}{\text{Pre-merger number of } B \text{ shares}}$$

x A shares for one B share		(B is worth x times A)	
2	=	0.833	× 4,500,000/1,875,000

The 1,875,000 B shares will be exchanged for 1,875,000 × 2 = 3,750,000 new A shares issued by A to remunerate B shareholders. After the merger the outstanding share capital of A will be made up of 4,500,000 + 3,750,000 = 8,250,000 shares.

2/ DILUTION OR ACCRETION CRITERIA

To help refine our analysis, let us suppose that Companies A and B have the following key financial elements:

(€m)	Sales	Net income	Book equity	Value of shareholders' equity
A	1,500	15	250	450
B	2,500	17.5	225	330

Putting aside for one moment potential industrial and commercial synergies, the financial elements of the new Company A + B resulting from the merger with B are as follows:

(€m)	Sales	Net income	Book equity	Value of shareholders' equity
Group A + B	4,000	32.5	475	780

In theory, the value of the new entity's shareholders' equity should be the sum of the value of the shareholders' equity of A and B. In practice, it is higher or lower than this amount, depending on how advantageous investors believe the merger is.

Using the agreed relative value ratio of 0.833 (B value is 0.833 the value of A), our performance measures for the new group are as follows:

(€m)	Group net income	Group book equity	Theoretical value of group shareholders' equity
The ex-shareholders of A have a claim on: vs. before the transaction:	17.7 15	259 250	425 450
The ex-shareholders of B have a claim on: vs. before the transaction:	14.8 17.5	216 225	355 330
TOTAL Before transaction: After transaction:	32.5 32.5	475 475	780 780

As a result of the agreed relative value ratio, the ex-shareholders of B suffer a **dilution** (reduction) in book equity, as their portion declines from €225m to €216m, and in their share of the net income of the new entity. At the same time, they enjoy an **accretion** in their share of the new group's theoretical market capitalisation from €330m to €355m. This is because A has accepted as a value for B's equity (€375m) a value above B's market

value of equity of €330m, whilst A was valued during negotiations at the actual market value of its equity (€450m). This is likely to be a compensation for the loss of control of B shareholders, who are now in a minority position in the new group.[3] Naturally, the situation is the opposite for the ex-shareholders of A.

> When A absorbs B via a share exchange, if the relative value of A/B negotiated for the merger is more than the relative ratio calculated for a given reference metric (value of shareholders' equity, book value, net income, etc.), the ex-shareholders of A enjoy an accretion for that metric.
>
> On the other hand, when the agreed relative value of A/B is less than the reference metric, A's shareholders will suffer dilution for that metric.

Turning our attention now to the earnings per share of Companies A and B, we observe the following:

	Value of shareholders' equity (€m)	Net income (€m)	P/E ratio[4]	Number of shares (million)	Earnings per share (€)
Company A	450	15	30	4.5	3.33
Company B	330	17.5	18.9	1.875	9.33

On the basis of the relative value ratio agreed in the merger of 0.833 (375 / 450), the earnings per share of the new group A now stands at (15 + 17.5) / (4.5 + 3.75), or €3.94 per share. EPS has risen from 3.33 to 3.94, representing an increase of slightly less than 20%. The reason is that the portion of earnings deriving from ex-Company B is purchased with shares valued at A's P/E multiple of 30 (450 / 15), whereas B is valued at a P/E multiple of 21 (375 / 17.5). Company A has issued a number of shares that are relatively low compared with the additional net income that B has contributed to A's initial net income.

> Earnings per share (before acquisition accounting) automatically increase in a merger when the P/E ratio of the acquiring company is greater than the P/E ratio of the acquired company (and vice versa).

But let's not fool ourselves. This EPS growth is not synonymous with value creation. If the merger had gone the other way (B absorbs A), we would have seen dilution, even though economically speaking the end result would have been identical.

The reasoning is similar for other performance metrics, such as cash flow per share.

3/ NEGOTIATION ZONE AND SYNERGIES

As an all-share merger consists conceptually of a purchase followed by a reserved capital increase, the sharing of synergies is a subject of negotiation just as it is in the case of a cash purchase.

In our example, let us suppose that synergies between A and B will increase the after-tax income of the merged group by €10m from the first year onwards.

The big unknown is the credit and the value investors will ascribe to these synergies:

€300m – i.e. a valuation based on A's P/E ratio of 30;

€189m – i.e. a valuation based on B's P/E ratio of 18.9;

€240m – i.e. a valuation based on a P/E ratio of 24, the average of the P/Es of A and B (780 / 32.5);

some other value.

Two factors lead us to believe that investors will attribute a value that is lower than these estimates:

The amount of synergies announced at the time of the merger is only an estimate and the announcers have an interest in maximising it to induce shareholders to approve the transaction. In practice, making a merger or an acquisition work is a managerial challenge. You have to motivate employees who may previously have been competitors to work together, create a new corporate culture, avoid losing customers who want to maintain a wide variety of suppliers, etc. Experience has shown that:

- more than half of all mergers fail on this score;
- actual synergies are slower in coming;
- the amount of synergies is lower than originally announced.

Sooner or later, the company will not be the only one in the industry to merge. Because mergers and acquisitions tend to come in waves, rival companies will be tempted to merge for the same reasons: to unlock synergies and remain competitive. As competition also consolidates, all market participants will be able to lower prices or refrain from raising them, to the joy of the consumer. As a result, the group that first benefited from merger synergies will be forced to give back some of its gains to its customers, employees and suppliers.

Based on this information, let's assume that the investors in our example value the €10m p.a. in synergies at a P/E of 12, or €120m. The value of shareholders' equity of the new group is therefore:

$$450 + 330 + 120 = 900\text{m}$$

Value is created in the amount of 900 − 780 = €120m. This is not financial value creation, but the result of the merger itself, which leads to cost savings and/or revenue enhancements, i.e. synergies. The €120m synergy pie will be shared between the shareholders of A and B.

At the extreme, the shareholders of A might value B at €450m. In other words, they might attribute the full present value of the synergies to the shareholders of B. The relative value ratio would then be at its maximum, 1.[5] Note that in setting the relative value ratio at 0.833, they had already offered the ex-shareholders of B 66%[6] of the value of the synergies!

The relative value ratios of 0.579 (330 / (450 + 120)) and 1 constitute the upper and lower financial boundaries of the negotiable range. If they agree on 0.579, the shareholders of A will have kept all of the value of the synergies for themselves. Conversely, at 1, all of the synergies accrue to the shareholders of B.

The relative value choice determines the relative ownership stake of the two groups of shareholders, A's and B's, in the post-merger group, which ranges from 36.7%/63.3% to 50%/50%, and consequently the value of their respective stakes.

Determining the value of potential synergies is a crucial negotiating stage. It determines the maximum merger premium that Company A will be willing to pay to the shareholders of Company B:

large enough to encourage shareholders of B to approve the merger;

small enough to still be value-creating for A's shareholders.

4/ THE "BOOTSTRAP GAME"

Until now, we have assumed that the market capitalisation of the new group will remain equal to the sum of the two initial market capitalisations. In practice, a merger often causes an adjustment in the P/E, called a **rerating**. As a result, significant transfers of value occur to and between the groups of shareholders. These value transfers often offset a sacrifice with respect to the post-merger ownership stake or a post-merger performance metric.

If we assume that the new Group A continues to enjoy a P/E ratio of 30 (ignoring synergies), as did the pre-merger Company A, its market capitalisation will be €975m. The ex-shareholders of A, who appeared to give up some relative value with regard to the post-merger market cap metric, see the value of their share of the new group rise to €531m,[7] whereas they previously owned 100% of a company that was worth only €450m. As for the ex-shareholders of B, they now hold 45.5% of the new group, a stake worth €444m, versus 100% of a company previously valued at only €330m.

Whereas it seemed A's shareholders came out losing, in fact it's a win–win situation. The transaction is a money machine! The limits of this model are clear, however. A's pre-merger P/E ratio of 30 was the P/E ratio of a growth

company. Group A will maintain its level of growth after the merger only if it can light a fire under B and convince investors that the new group also merits a P/E ratio of 30.

This model works only if Company A keeps growing through acquisition, “kissing” larger and larger “sleeping beauties” and bringing them back to life. If not, the P/E ratio of the new group will simply correspond to the weighted average of the P/E ratios of the merged companies.

You have probably noticed by now that it is advantageous to have a high share price, and hence a high P/E ratio. They allow you to issue highly valued paper to carry out acquisitions at relatively low cost, all the while posting automatic increases in earnings per share. You undoubtedly also know how to recognise an accelerating treadmill when you see one.

> The higher a company's P/E ratio is, the more attractive it is for the company to make acquisitions.

The potential immediate rerating after the merger does not guarantee creation of shareholder value. In the long run, only the new group's economic performance will enable it to maintain its high P/E multiple.

5/ WHICH WAY SHOULD THE MERGER GO?

Is A going to absorb B or the reverse? Several factors have to be taken into account.

Whether the company is listed or not is a factor, since in a merger between a listed and an unlisted company, it is likely that the listed company will take over the unlisted one in order to simplify administrative procedures and to avoid an exchange of shares for the hundreds, thousands or even hundreds of thousands of shareholders of the listed company.

There are, of course, legal considerations when agreements signed by the acquired company contain a change-of-control clause.

There are also psychological reasons why sometimes it makes more sense to continue trading under the name or structure of an entity which has been in existence for a very long time and which has great sentimental value for management and shareholders. In such cases, it is the oldest structure that

becomes the acquiring company (although the name of the acquiring company could also just be changed).

There are also some managers who believe that they will be in a better position within the new structure if their company is the acquiring company rather than the acquired company. There are others who wish to make a symbolic statement about where the power lies, which can then become a politically sensitive issue if the two groups are not of the same nationality.

Then there are those who are obsessed with EPS, who are keen for the acquiring company to be the one with the highest P/E ratio so the merger will be accretive in terms of EPS. Our readers know how cautious we are when it comes to EPS.[8]

In some countries, the tax issue is the main factor in deciding which way the merger should go. The acquired company loses all of its tax-loss carryforwards, while the acquiring company is allowed to hold onto its own. Elsewhere, it is possible for the company resulting from the merger of two companies to hold onto the tax-loss carryforwards of the company that is acquired, provided that the merger is not being carried out solely for tax reasons. This reduces the importance of the tax issue in deciding who should take over whom.

6/ ACCOUNTING FOR MERGERS

In a merger (or share contribution), there are two types of values which may or may not coincide: the financial value which serves as a reference for determining the relative weight, and the amount at which the assets are contributed for accounting purposes to the acquiring company (or beneficiary of the contributions).

Where the two merging companies do not have the same shareholders, the assets and liabilities of the company being acquired should be included at their market value in the accounts of the acquiring company.

On the other hand, when the two merging entities have the same shareholder (intra-group transaction), the assets and liabilities of the absorbed company are included at their book value in the accounts of the absorbing company, in the corporate and consolidated accounts.

Section 46.3 DEMERGERS AND SPLIT-OFFS

1/ PRINCIPLES

The principle of a demerger is simple. A group with several divisions, in most cases two, decides to separate them into distinct companies (some use the term carve-in for the separation of two activities within the same group). The shares of the newly created companies are distributed to the shareholders in exchange for shares of the parent group. The shareholders, who are the same as the shareholders of the original group, now own shares in two or more companies and can buy or sell them as they see fit.

There are two basic types of transactions, depending on whether, once approved, the transaction applies to all shareholders or gives shareholders the option of participating.

A **demerger** is a separation of the activities of a group: the original shareholders become the shareholders of the separated companies. The transaction can be carried out by distributing the shares of a subsidiary in the form of a dividend (a spin-off), or by dissolving the parent company and distributing the shares of the ex-subsidiaries to the shareholders (a split-up). Immediately after the transaction, the shareholders of the demerged companies are the same, but ownership evolves very quickly thereafter.

In a **split-off**, shareholders have the option to exchange their shares in the parent company for shares in a subsidiary. To avoid unnecessary holdings of treasury shares, the shares tendered are cancelled. A split-off is a share repurchase paid for with shares in a subsidiary rather than in cash. If all shareholders tender their shares, the split-off is identical to a demerger. If the offer is relatively unsuccessful, the parent company remains a shareholder of the subsidiary.

2/ WHY DEMERGE?

Broadly speaking, studies on demergers have shown that the shares of the separated companies outperform the market, both in the short and long term.

In the context of the efficient markets hypothesis and agency theory, demergers are an answer to conglomerate discounts (see Section 42.1) or

groups that are too diversified. In this sense, a demerger creates value because it solves the following problems:

Allocation of capital within a conglomerate is suboptimal, benefiting divisions in difficulty and penalising healthy ones, making it harder for the latter to grow.

The market values primary businesses correctly but undervalues secondary businesses. A demerger can also help a group to dispose of an asset that is hard to sell (Osram for Siemens, South 32 for BHP Billiton).

The market has trouble understanding conglomerates, a problem made worse by the fact that virtually all financial analysts are specialised by industry. With a very large number of listed companies, investors prefer simplicity. In addition, large conglomerates communicate less about smaller divisions, thus increasing the information asymmetry.

Lack of motivation of managers of non-core divisions.

Small base of investors interested by all the businesses of the group.

The conglomerate has operating costs that add to the costs of the operating units without necessarily creating value.

Demergers expose the newly created companies to potential takeovers. Prior to the demerger, the company might have been too big or too diverse. Potential acquirers might not have been interested in all of its businesses, and the process of acquiring the entire company and then selling off the unwanted businesses is cumbersome and risky. A demerger creates smaller, pure-play companies, which are more attractive in the takeover market. Empirically, it has been shown that demerged subsidiaries do not always outperform. This is the case when the parent company has completely divested its interest in the new company or has itself become subject to a takeover bid.

Lastly, lenders are not great fans of demergers. By reducing the diversity of activities and consequently potentially increasing the volatility of cash flows, they increase the risk for lenders. At one extreme, the value of their debt decreases if the transaction is structured in such a way that one of the new companies carries all the debt, while the other is financed by equity capital only.

In practice, however, debtholders are rarely spoiled that way. Loan agreements and bond indentures generally stipulate that, in the event of a demerger, the loan or the bonds become immediately due and payable.

Consequently they are in a position to negotiate demerger terms that are not unfavourable to them. This explains why empirical studies have shown that, on average, demergers lead to no transfer of value from creditors to shareholders.

> The sharing of the group debt between the different companies emerging from a demerger is a major issue that can jeopardise a demerger.

Because of their complexity and the detailed preparation they require (over at least six months), demergers are less frequent than mergers. Examples of demergers include Dow DuPont (Chemicals) into Dow, Dupont, and Corteva; PPR into Kering and Fnac, followed by Kering and Puma (retail and fashion); Metro (wholesale retailer) and Ceconomy (consumer electronics); and for split-offs, Pfizer/Zoetis (animal health); Vivendi/UMG.

Demerging is not a panacea. If one of the demerged businesses is too small, its shares will suffer a deep liquidity discount. The same can be said if the demerger leads to the companies disappearing from a stock market index. In emerging countries, the diversification of groups seems to be a success factor (see Chapter 42).

If we wanted to be cynical, we might say that demergers represent the triumph of sloth (investors and analysts do not take the time to understand complex groups) and selfishness (managers want to finance only the high-performance businesses).

> But they are also the triumph of financial theory, which says that enterprises that bring together unrelated businesses without creating value will not stay as a group indefinitely.

SUMMARY

The summary of this chapter can be downloaded from www.vernimmen.com.

Business combinations, commonly referred to as mergers and acquisitions, can take many forms. The most important distinction among them is the method of payment: (i) cash or cash and shares; (ii) 100% in shares.

All-share deals can take several forms:

legal merger: two or more companies are combined to form a single company. In general, one company is dissolved and absorbed into the other;

contribution of shares: the shareholders of Company B exchange their shares for shares of Company A;

asset contribution: Company B transfers a portion of its assets to Company A in exchange for shares issued by Company A.

The economics of the business combination are independent of the financial arrangements. That said, in an all-share deal the resources of the two entities are added together, increasing the merged company's financial capacity, compared with what it would have been after the conclusion of a cash deal. Also, in an all-share deal, all the shareholders of the resulting group share the risks of the merger. When the deal is negotiated, the companies are valued and the relative value ratio and exchange ratio are set. The exchange ratio is the number of shares of the acquiring company that will be exchanged for the tendered shares of the acquired company. The relative value ratio determines the position of each group of shareholders in the newly merged group.

The higher a company's P/E ratio is, the more tempted it will be to carry out acquisitions by issuing shares, because its earnings per share will automatically increase. But be careful! No value is automatically created. The increase in EPS is only a mathematical result deriving from the difference between the P/E ratios of the acquirer and the acquiree. At the same time, the P/E ratio of the new entity declines, because the market capitalisations of the new group should theoretically correspond to the sum of the market capitalisation of the two companies prior to the

merger. Sometimes the new company's P/E ratio stays the same as the acquiring company's P/E ratio. We call this the “magic kiss” effect, because it implies that the company has only to “wake up” the “sleeping beauty” it has acquired. In each case, the value of the merger synergies is added to the value of the new company. How they are shared by the two groups of shareholders determines the premium the acquiring company will pay to the target's shareholders to persuade them to participate in the deal.

A demerger is a simple concept. A diversified group decides to separate into distinct companies and to distribute the shares of the new companies to shareholders in return for shares of the parent group. It is often an answer to too low a valuation for a group with too far-flung activities.

The value created by a demerger can be analysed as follows:

unlocking the value trapped in the conglomerate discount (efficient markets hypothesis);

increasing the motivation of the managers of the newly independent company (agency theory).

A demerger results in companies being more exposed to takeover bids.

QUESTIONS

1/What is the fundamental difference between a merger and a sale:

for the shareholder of the acquired company?

for the acquiring company?

for the shareholder of the acquiring company?

for the acquired company?

2/Unlike what happens when a company is sold, when companies merge their shareholders' equity is added together. Why?

3/In your view, what are the possible reasons behind a merger? And a demerger?

4/Ignoring tax issues, would a shareholder with a 51% controlling interest in a company be better off buying another company or merging with it?

5/Is the dilution of EPS that follows all mergers generally greater or less than that which follows a standard share issue?

6/Why is the determination of the exchange ratio important?

7/What is the difference between the relative value ratio and the exchange ratio?

8/When negotiating, is agreement first reached on the relative value or on the calculation method?

9/Why do shareholders in an acquired company agree to the dilution of their shareholdings after completion of the merger?

10/Where does the creation of value lie in a merger?

11/Why are the legal procedures related to mergers so onerous?

12/In what circumstances can a demerger lead to creation of shareholder value? And value for creditors?

13/Can the success of a merger be judged by comparing the market performance of the new entity with that of the reference index?

14/Can the success of a merger be judged by looking at the change in share price of the companies when the merger is announced?

You'll find more questions at www.vernimmen.com.

EXERCISES

1/Alpha AG is wholly owned by Mr Alpha and Beta AG is wholly owned by Mr Beta. The key figures for the two companies are as follows:

	Net profit	Equity value	Book equity
Alpha	60	750	800
Beta	30	1,500	400

Alpha acquires Beta. Calculate the shareholdings (as a percentage) of Mr Alpha and Mr Beta using net profits, equity value and book equity. What are your conclusions?

2/Below are the key figures for Gamma plc and Delta plc:

	Net profit	Book equity	P/E	Number of shares
Gamma	20	60	50	2,000
Delta	40	300	8	1,000

Gamma acquires Delta. The criterion selected for calculation purposes is equity value. Calculate the old and new EPS, equity per share and the percentage of the shareholdings of the former shareholders of Gamma in the new entity.

Redo the calculations with a P/E ratio for Gamma of only 15, and then 6.

What are the minimum and maximum relative values if the synergies that come out of the merger increase the profits of the new group by 10, and if the new group is valued on the basis of a P/E ratio of 21? What would the ratios be then?

What is the value of Epsilon, the new name for the merged Gamma and Delta (still with synergies of 10) if it is valued on the basis of a P/E ratio of 50?

What is the value created and what does it represent?

ANSWERS

Questions

1/*The shareholder of the acquired company receives shares instead of cash. The acquiring company issues shares instead of reducing cash (or incurring debt), its shareholding structure is modified. The shareholder of the acquiring company loses some control, but the risk is shared. The acquired company no longer exists as a separate legal entity.*

2/*By definition, since assets and liabilities are pooled together with no cash payment.*

3/*Synergies, defence against an unwelcome attack. Reduction of the conglomerate discount, focus on core business, defence against an unwelcome attack.*

4/*Having the company buy the target, so as not to lose its controlling interest in it.*

5/*This isn't where the problem lies. What's important is to know whether the merger will create value and not whether EPS will be diluted.*

6/*Because it is the basis for sharing the creation of value and sharing power inside the new group.*

7/*Relative value is the value of one of the companies compared with the other. Exchange ratio is the number of shares in the acquiring company that are exchanged for one share in the acquired company.*

8/*On relative value and then on the calculation methods which would lead to the determination of the agreed relative value. On the surface, it looks like the opposite is true.*

9/*Because they form part of a larger whole that is likely to generate synergies and because the merger could result in the P/E of the new entity being revalued.*

10/*In the synergies created by the merger.*

11/*In order to ensure the equal treatment of shareholders – the rights of all shareholders should be respected.*

12/*When there is a conglomerate discount that will disappear. Rarely for creditors.*

13/*Only after taking into account the beta of the group which may be different from 1.*

14/*Yes if the markets are in equilibrium and if the information has not leaked prior to the announcement.*

Exercises

A detailed Excel version of the solutions is available at www.vernimmen.com.

1/

	Net profits	Value	Shareholders' equity
Mr Alpha's share	2/3	1/3	2/3
Mr Beta's share	1/3	2/3	1/3

The criteria selected are crucial as they can lead to different relative weights and share allocations.

2/(a) *and* (b)

	Old (for Gamma)	New (P/E = 50)	New (P/E = 15)	New (P/E = 6)
EPS	0.01	0.0227	0.0145	0.0082
Equity per share	0.03	0.136	0.087	0.049
% of control held by Gamma shareholders	100% of Gamma	75.8%	48.4%	27.3%

The higher a company's P/E ratio, the more it will get out of a merger.

If Gamma shareholders get all of the synergies: relative value of 3.59 and exchange ratio of 0.557 Gamma shares for 1 Delta share. If Gamma shareholders sell all of the synergies: relative value of 2.13 and exchange ratio of 0.940 Gamma shares for 1 Delta share.

Value of the whole = 50 × (40 + 20 + 10) = 3,500.

Wealth created = 2,180. The wealth created is a result of synergies (500) and the revaluation of Delta (1,680).

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NOTES

1 *The acquisition of B is financed by debt, not a capital increase.*

2 *In fact, Company B, not its shareholders, holds 45.5% of A.*

3 *And just because A agrees in merger negotiations to value B for a given value (€375m) this doesn't mean that the A shares that B shareholders will receive in exchange will be worth €375m. In this example they are only worth €355m. The shareholders of B, by becoming shareholders of the new group, bear their share (45.5%) of the €45m (375 − 330) overvaluation: 45.5% × €45m = €20m corresponding to the difference between their valuation at parity (€375m) and the value of A's shares after the merger (€355m).*

4 *Price/earnings ratio.*

5 *(330 + 120) / 450*.

6 *(45.5% × 900 − 330) / 120*.

7 *54.5% × 975*.

8 *See Section 27.5*.

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Chapter 47
LEVERAGED BUYOUTS (LBOs)

Leverage on management!

A leveraged buyout (LBO) is the acquisition of a company by one or several private equity funds who finance their purchase with a significant amount of borrowed funds. Most of the time, LBOs bring improvements in operating performance as the management is highly motivated (high potential for capital gains) and under pressure to rapidly pay down the debt incurred.

Why are financial investors willing to pay more for a company than a trade buyer that can extract synergies? Are they miracle workers? Watch out for smoke and mirrors. Value is not always created where you think it will be. Agency theory will be very useful, as the main innovation of LBOs is new corporate governance, which, in certain cases, is more efficient than that of listed or family companies.

Section 47.1 LBO STRUCTURES

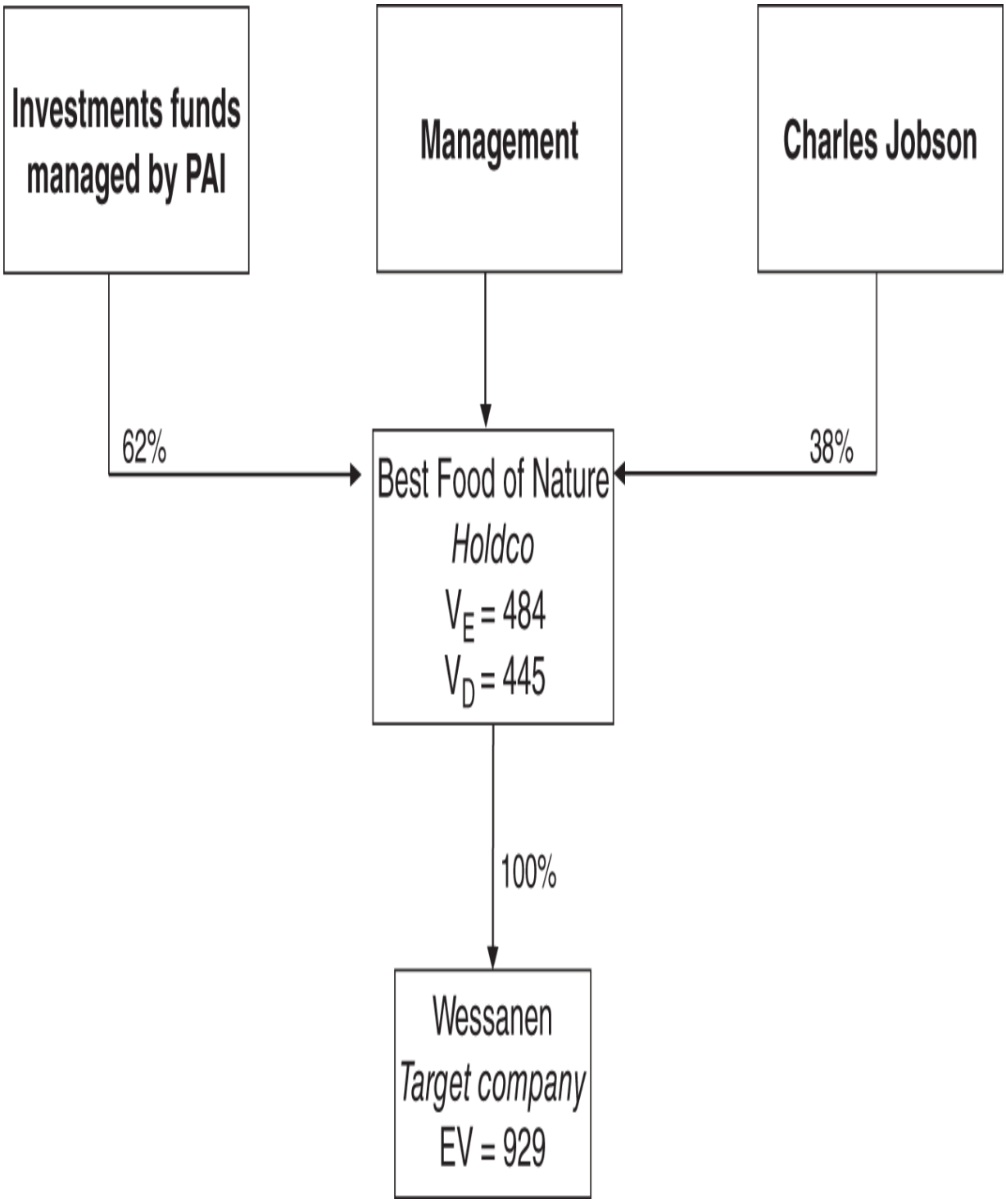
1/ PRINCIPLE

The basic principle is to create a holding company, the sole purpose of which is to hold shares. The holding company borrows money to buy another company, often called the “target”. The holding company will pay interest on its debt and pay back the principal from the cash flows generated by the target. In LBO jargon, the holding company is often called *NewCo* or *HoldCo*.

Operating assets are the same after the transaction as they were before it. Only the financial structure of the group changes. Equity capital is sharply reduced and the previous shareholders sell part or all of their holding.

From a strictly accounting point of view, this setup makes it possible to benefit from the effect of financial gearing (see Chapter 13).

Now let us take a look at the example of the organic product group Wessanen[1] (brands Bjorg, Clipper, Altereco, etc.), acquired in September 2019 by the LBO fund PAI and the investor Charles Jobson for an enterprise value of €929m. Wessanen generated 2018 sales of €628m and an EBITDA of €58m. The acquiring holding company was set up with €484m of equity and €445m of debt.



Best Food of Nature debt is made up of a 7-year loan for €390m, and a second-lien debt maturing in 2027 (i.e. one year later) for €55m.

The balance sheets are as follows:

Revalued balance sheet of Wessanen		Best Food of Nature's unconsolidated balance sheet		Group's consolidated balance sheet	
Operating assets €929m	Shareholders' equity €929m	Shares of Wessanen €929m	Shareholders' equity €484m	Operating assets €929m	Shareholders' equity €484m
			Debt €445m		Debt €445m

Note that consolidated shareholders' equity, on a revalued basis, is now 55% lower than it was prior to the LBO.

> An LBO leads to a massive destruction of equity.

The profit and loss statement, meanwhile, is as follows:

(€m)	Wessanen	Best Food of Nature	Consolidated
Earnings before interest and tax	58	44[2]	58
− Interest expense at 5%	0	22	22
− Income tax at 25%	14	0	9[3]
= Net income	44	22	27

Best Food of Nature does not pay corporate income tax as dividends paid by Wessanen are tax-free coming from income already taxed at the Wessanen level.

2/ TYPES OF LBO TRANSACTIONS

Leveraged buyout (LBO) is the term for a variety of transactions in which an external financial investor uses leverage to purchase a company. Depending on how management is included in the takeover arrangements, LBOs fall into the following categories:

a **(leveraged) management buyout** or **(L)MBO** is a transaction undertaken by the existing management together with some or all of the company's employees;

if new management is put in place, it will be called a **management buy-in** or **MBI**;

when outside managers are brought in to reinforce the existing management, the transaction is called a **BIMBO**, i.e. a combination of a *buy-in* and a management *buy-out*. This is the most common type of LBO in the UK;

an **owner buyout (OBO)** is a transaction undertaken by the largest shareholder to gain full control over the company.

3/ TAX ISSUES

Obtaining tax consolidation between the holding company and the target is one of the drivers of the overall structure, as it allows financial costs paid by the holding company to be offset against pre-tax profits of the target company, reducing the overall corporate income tax paid.

In some countries, it is possible to merge the holding company and the target company soon after the completion of the LBO. In other countries this is not the case, as the local tax administration argues it is contrary to the target's interest to bear such a debt load. Provided tax consolidation is possible between the target and Holdco, this has no material consequence. If tax consolidation is not possible because, for example, the Holdco stake in the target company has not reached the required minimum threshold, then a **debt push down** may be necessary.

In order to perform a debt push down, the target company pays an extraordinary dividend to Holdco or carries out a share buy-back financed by debt, allowing Holdco to transfer part of its debt to the target company where financial expenses can be offset against taxable profits. If the target company is still listed, an independent financial expert is likely to be asked to deliver a **solvency opinion** testifying that the target debt load does not prevent it from properly operating in the foreseeable future.

4/ EXIT STRATEGIES

The lifespan of an LBO depends both on the speed at which the LBO fund can improve the company's performance and its capacity to sell it on to a third party or on the stock market. It is rarely less than two years in periods

of euphoria and it can be as long as seven or eight years during lean times. There are several exit strategies:

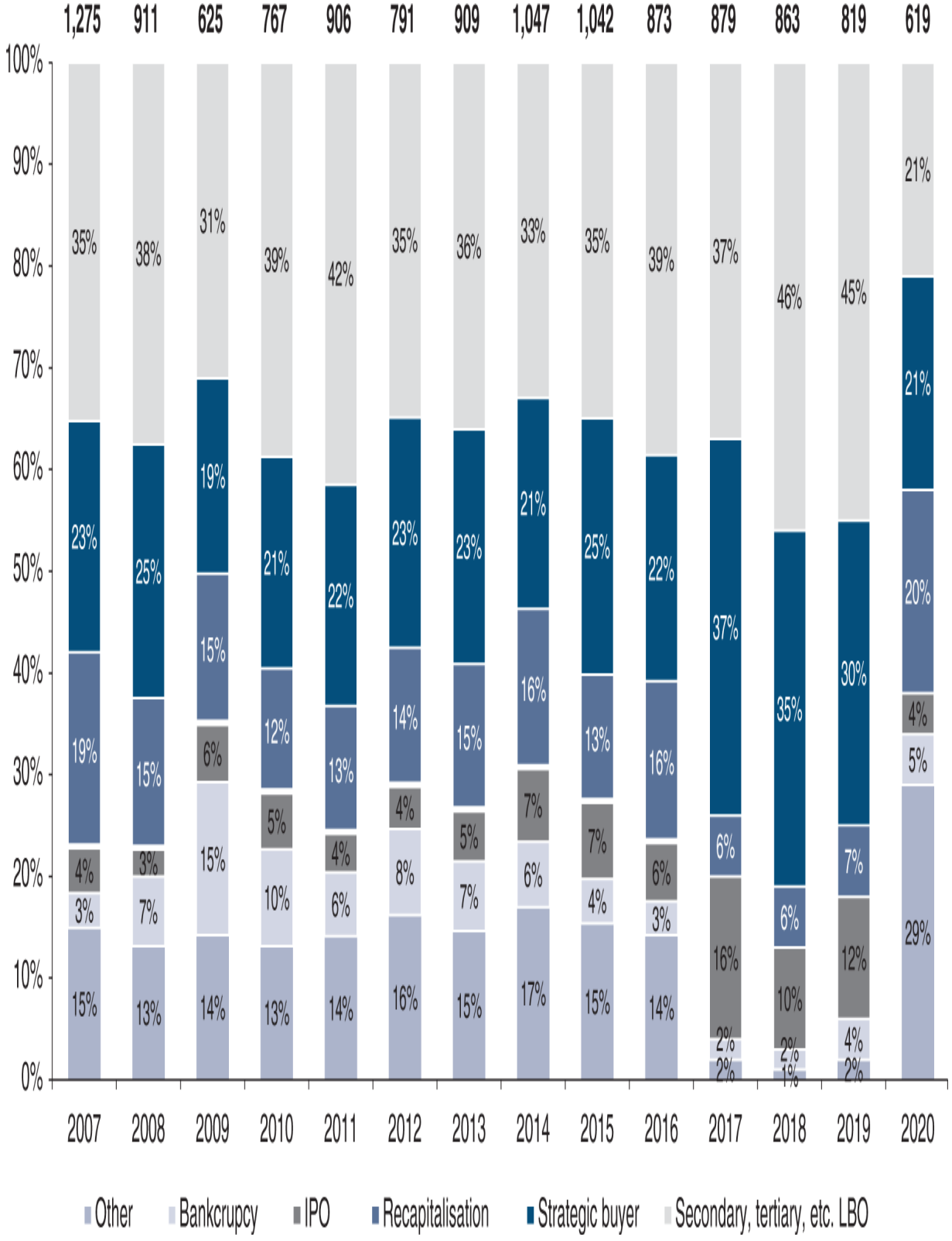
Sale to a trade buyer. Our general comment here is that in most cases financial investors bought the company because it had not attracted trade buyers at the right price. When the time has arrived for the exit of the financial buyer, either the market or the company will have had to have changed for a trade buyer to be interested. The private equity firm Apollo exited its investment in Endemol in 2020 through a sale to Banijay.

Initial public offering. This strategy must be implemented in stages, and it does not allow the sellers to obtain a control premium; most of the time they suffer from an IPO discount. It is more attractive for senior management than a trade sale. In 2019, Verallia was IPOed by Apollo and Bpifrance.

Sale to another financial investor, who, in turn, sets up another LBO. These “secondary” LBOs are becoming more and more common and we also see tertiary or even quaternary LBOs such as B&B. Hence, in 2021, EQT bought back the laboratory group Cerba to Partners Group and PSP.

A leveraged recapitalisation (or dividend recap). After a few years of debt reduction thanks to cash flow generation, the target takes on additional debt with the purpose of either paying a large dividend or repurchasing shares, thereby improving the performance of the fund and its IRR. The result is a far more financially leveraged company. These had disappeared after 2008 following debt markets' disfavour for LBOs, but have reappeared again since 2013, an example being Apria in 2021.

LBO exits in Europe since 2007



Source: Data from Invest Europe

A debt to equity swap allowing debtholders to gain control of the company when its debt load becomes too heavy to be repaid by the company's cash flows which, most of the time, have slumped compared to projections. Existing shareholders have refused to put in more equity to pay back part of the debt but they have agreed to allow a share issue to take place and to be diluted.

A bankruptcy when cash flows generated by the operating company are insufficient to allow for enough dividends to be paid to Holdco and when debtholders and shareholders cannot reach an agreement on a capital restructuring (new equity, lower interest rates, longer repayment schedule, etc.).

If the company has grown or become more profitable on the financial investors' watch, it will be easier for them to exit. Improvement may take the form of an internal growth strategy by geographical or product extension, a successful redundancy or cost-cutting plan or a series of bolt-on acquisitions in the sector. Size is important if flotation is the goal, because small companies are often undervalued on the stock market, if they manage to get listed at all.

That being said, a company whose LBO has failed as a result of an inability to pay off its debt is often in a pitiful state. The investment tap has been turned off, the most talented staff have seen the writing on the wall and have left and the remaining staff lack motivation. Turning such a company around presents a serious challenge!

Section 47.2 THE PLAYERS

The LBO market has become highly structured since the early 1990s. All the direct players (funds, banks, investors) and indirect players (financial, legal, strategic and management advisors) treat the LBO business as a specific business with dedicated teams. Industrialists and managers have become familiar with this type of structure.

1/ POTENTIAL TARGETS

The transactions we have just examined are feasible only with certain types of target companies. The target company must generate profits and cash flows that are sufficiently large and stable over time to meet the holding company's interest and debt payments. The target must not have burdensome investment needs. Mature companies that are relatively shielded from variations in the business cycle make the best candidates: food, retail, water, building materials, real estate, cinema theatres and business listings providers are all prime candidates.

THE WORLD'S 10 LARGEST LBOs

Target	Date	Sector	Equity sponsor	Value ($bn)
TXU	2007	Energy	KKR/TPG	45
Equity Office	2006	Real Estate	Blackstone	36
HCA	2006	Health	Bain/KKR	33
RJR Nabisco	1988	Food	KKR	30
Heinz	2013	Food	Berkshire Hathaway/3G Capital	28
Kinder Morgan	2006	Energy	Carlyle	27
Harrah's Entertainment	2006	Casino	Apollo/TPG	27
First Data	2007	Technology	KKR	27
Clear Channel	2006	Media	Bain/Thomas Lee	27
Alltel	2007	Telecom	TPG/Goldman Sachs	27

Source: Data from Thomson Financial

The group's LBO financing already packs a hefty financial risk, so the industrial risks had better be limited. Targets are usually drawn from sectors with high barriers to entry and minimal substitution risk. Targets are often positioned on niche markets and control a significant portion of them.

Traditionally, LBO targets were “cash cows”. As the euphoria subsided however, a shift has been observed towards companies exhibiting higher growth or operating in sectors with opportunities for consolidation (build-up). As the risk aversion of investors decreases, some private equity funds have carried out LBOs in more difficult sectors.

Targets must now also show a satisfactory environmental, social and governance (ESG) policy, as these items are now fully included in the investment criteria of the funds and their investors.

2/ THE SELLERS

Recently, more than half of all targets have been companies already under an LBO, sold by one private equity investor to another, for the second, third or more times, such as Cerba, Armacell, etc.

There are many European SMEs that were set up or grew substantially in the 1960s and 1970s, run by a majority shareholder-manager. These shareholder-managers are now reaching retirement age and may be tempted by LBO funds for the disposal of their companies, rather than selling them to a direct competitor (often seen as the devil incarnate) or seeking a stock market exit, which may be difficult. All the more so when the company bears the family name, which may disappear if it is sold to another industrial player.

Some sectors are so concentrated that only LBO funds can buy a target as the antitrust authorities would never allow a competitor to buy it or would impose severe disposals, making such an acquisition unpalatable to many trade buyers. The larger transactions fall into the latter category (Venelia, AkzoNobel's chemicals division).

Finally, some listed companies that are undervalued (often because of liquidity issues or because of lack of attention from the investment community because of their size) sometimes opt for **public-to-private** (P-

to-P) LBOs. In the process, the company is delisted from the stock exchange. Despite the fact that these transactions are complex to structure and generate high execution risk, they are becoming more and more common thanks to the drop in market values (Wessanen).

3/ LBO FUNDS ARE THE EQUITY INVESTORS

Setting up an LBO requires specific expertise, and certain investment funds specialise in them. These are called *private equity sponsors*, because they invest in the equity capital of unlisted companies.

LBOs are particularly risky because of their high gearing. Investors will therefore undoubtedly require high returns. Indeed, required returns are often in the region of 15% p.a. In addition, in order to eliminate diversifiable risk, these specialised investment funds often invest in several LBOs.

In Europe alone, there are over 100 LBO funds in operation. The US and UK LBO markets are more mature than those of Continental Europe. The Asian market is nascent. For this reason, Anglo-Saxon funds such as BC Partners, Blackstone, Carlyle, Cinven, CVC, TPG and KKR dominate the market, particularly when it comes to large transactions. In the meantime, the purely European funds, such as Eurazeo, Industri Kapital and PAI, are holding their own, generally specialising in certain sectors or geographic areas.

To reduce their risk or increase their target size, LBO funds also invest alongside another LBO fund or their own investors (they form a consortium) or an industrial company (sometimes the seller) with a minority stake. In this case, the industrial company contributes its knowledge of the business and the LBO fund its expertise in financial engineering, the legal framework and taxation.

Most of the private equity sponsors contribute equity for between 30% and 50% of the total financing. The time (first half of 2007) when they accounted for 20% of financing is over! In order to facilitate the transfer of cash, part of the equity could also take the form of highly subordinated convertible bonds, which will be converted in the event of the company experiencing financial difficulties. Interest on such bonds is tax-deductible.

Materially, LBO funds are organised in the form of a management company (the general partner or GP) that is held by partners who manage funds raised from institutional investors[4] or high-net-worth individuals (the limited partners, or LPs). When funds need to be raised quickly, a bank may advance the funds pending the raising of equity (an equity bridge). LBO funds then call on the limited partners for the funds that they have committed to bringing, as investments are made. LPs also sometimes invest directly alongside the fund, which strengthens its intervention capacity. This is known as co-investment.

When a fund has invested more than 75% of the equity it has raised, another fund is launched. Each fund is required to return to investors all of the proceeds of divestments as these are made, and the ultimate aim is for the fund to be liquidated after a given number of years, and at the latest 10 years.

The management company, in other words the partners of the LBO funds, is paid on the basis of a percentage of the funds invested (c. 2% of invested funds) and a percentage of the capital gains made (often close to 20% of the capital gain) above a minimum rate of return of 6% to 8% (the hurdle rate), known as **carried interest**.

Some funds decide to list their shares on the stock market, like Blackstone did in 2007,[5] while others such as 3i and Wendel are listed for historical reasons.

4/ THE LENDERS

For smaller transactions (less than €10m), there is a single bank lender, often the target company's main bank or a small group of its usual bankers (club deal).

For larger transactions, debt financing is more complex. The LBO fund negotiates the debt structure and conditions with a pool of bankers. Most of the time, bankers propose a financing to all candidates (even the one advising the seller). This is **staple financing**.

The high degree of financial gearing requires not only traditional bank financing, but also subordinated lending and **mezzanine debt**, which lie between traditional financing and shareholders' equity. This results in a

four-tier structure: traditional, secured loans called **senior debt**, to be repaid first; **subordinated** or **junior debt**, to be repaid after the senior debt; mezzanine financing, the repayment of which is subordinated to the repayment of the junior and senior debt; and, last in line, shareholders' equity.

Sometimes, shareholders of the target grant a vendor loan to the LBO fund (part of the price of which payment is deferred) to help finance the transaction.

(a) Senior debt

Senior debt generally totals three to five times the target's EBITDA.[6] It is composed of several tranches, from least to most risky:

tranche A is repaid in equal instalments over six to seven years;

tranches B and C are repaid over a longer period (seven to eight years for the B tranche and eight to nine years for the C tranche) after the A tranche has been amortised. Tranche C has a tendency to disappear.

Each tranche has a specific interest rate, depending on its characteristics (tranches B and C will be more expensive than tranche A because they are repaid after and are therefore more risky). This rate is relatively high (several hundred base points above the Euribor; 100 base points = 1%).

For senior debt, guarantees are held on the target's shares, along with covenants. When it is a cov-lite (covenant light) transaction, then they have been reduced or are non-existent!

When the debt amount is high, the loan will be syndicated to several banks (see Section 25.8). The senior debt can take the form of a single tranche B: *Term loan B* which can then be placed not only with banks but also with institutional investors.

An alternative (or complement) is to issue Senior Secured Notes (Senior High Yield Notes) if the size of the transaction is sufficient, without them being subordinated, such as those we will see in the next paragraph.

Collateralised debt obligation (CDO) funds have been created, which subscribed or bought tranches of LBO debt. Their investors are mainly insurance companies, hedge funds and pension funds.

(b) Junior or subordinated debt

High-yield bond (subordinated notes) issues are sometimes used to finance LBOs, but this technique is reserved for the largest transactions so as to ensure sufficient liquidity. In practice the lower limit is around €150m. An advantage of this type of financing is that it carries a bullet repayment and a maturity of 7–10 years. Given the associated risk, high-yield LBO debt, as the name suggests, offers investors high interest rates, as much as 600 basis points over government bond yields. There has definitely been an upsurge in high-yield bonds used to fund LBOs since late 2009. This is a window of opportunity that shut very suddenly at the start of the Covid-19 crisis but reopened quite quickly in summer 2020.

Mezzanine debt also comes under the heading of (deeply) subordinated debt, but is unlisted and provided by specialised funds. As we saw in Chapter 24, certain instruments accommodate this financing need admirably. These "hybrid" securities include convertible bonds, mandatory convertibles, warrants, bonds with warrants attached, etc.

Given the associated risk, investors in mezzanine debt – "mezzaniners" – demand not only a high return, but also a say in management. Accordingly, they are sometimes represented on the board of directors.

Returns on mezzanine debt take three forms: a relatively low interest rate (5%–6%) paid in cash; a deferred interest or payment in kind (PIK) for 5%–8%; and a share in any capital gain when the LBO fund sells its stake.

Most of the time, mezzanine debt is made of bullet bonds[7] with warrants attached. Mezzanine financing is a true mixture of debt and shareholders' equity. Indeed, mezzaniners demand returns more akin to the realm of equity investors, around 10% to 12% p.a.

Subordinated and mezzanine debt offer the following advantages:

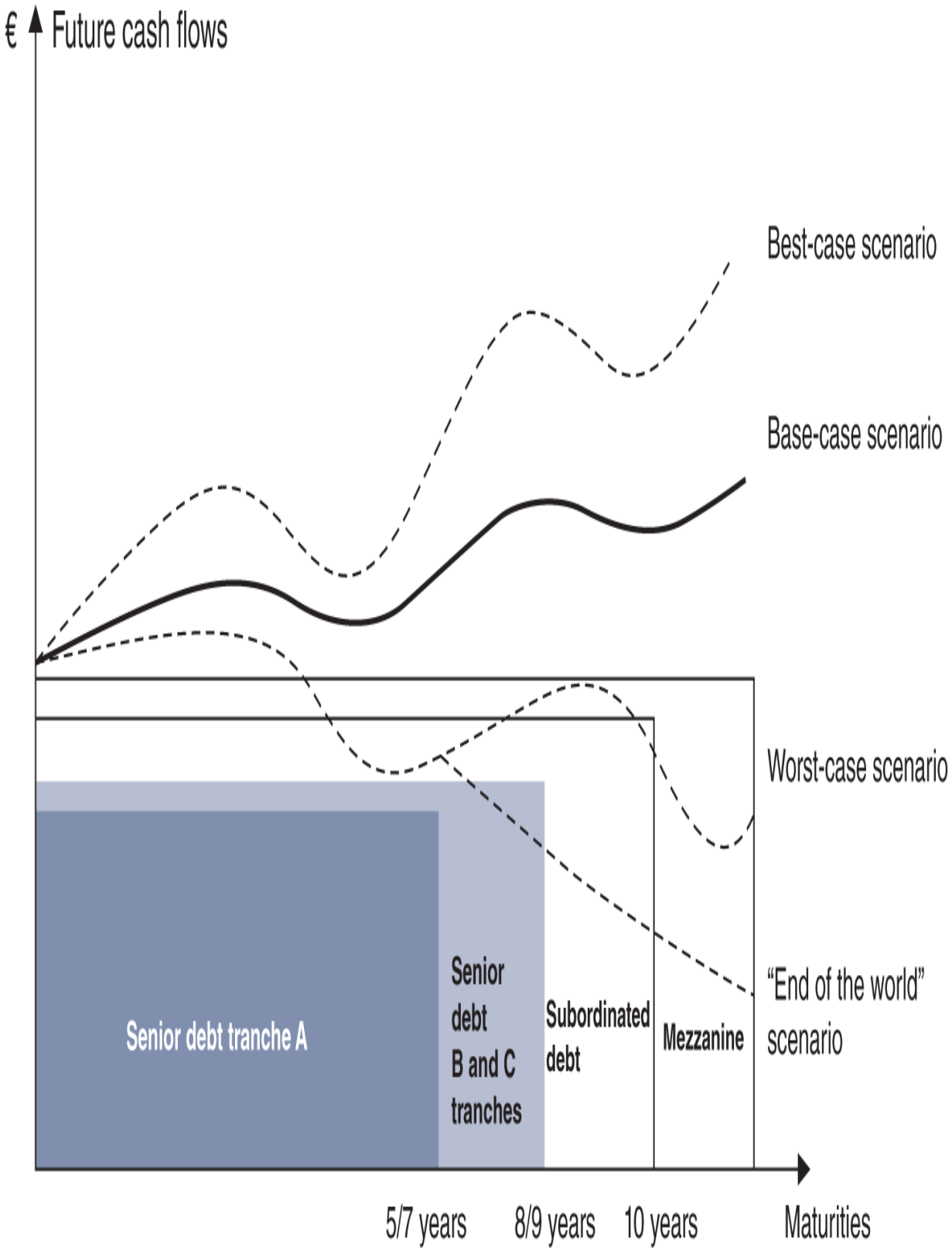
they allow the company to lift gearing beyond the level acceptable for bank lending;

they are longer term than traditional loans and a portion of the higher interest rate is paid through a potential dilution. The holders of mezzanine debt often benefit from call options or warrants on the shares of the holding company;

they make upstreaming of cash flow from the target company to the holding company more flexible. Mezzanine debt has its own specific terms for repayment, and often for interest payments as well. Payments to holders of mezzanine debt are subordinated to the payments on senior and junior debt;

they make possible a financing structure that would be impossible by using only equity capital and senior debt.

LBO financing



LBO financing spreads the risk of the project among several types of instruments, from the least risky (senior debt) to the most risky (common shares). The risk profile of each instrument corresponds to the preferences of a different type of investor.

(c) Securitisation

LBOs are sometimes partly financed by securitisation (see Chapter 21). Securitised assets include receivables and/or inventories when there is a secondary market for them. The securitisation buyout is similar to the standard securitisation of receivables, but aims to securitise the cash flows from the entire operating cycle.

(d) Other financing

For small and medium-sized LBOs, senior and junior debt can be replaced by a **unitranche debt**. This is a bullet debt subscribed by an investment fund specialised in debt, whose cost is around 5%–8%, i.e. between the cost of a senior debt and that of a junior debt. Contrary to Term loan B, unitranche debt is not liquid.

Financing at the level of the operating company generally tops up the financing of Holdco:

either through a **revolving credit facility** (RCF), which can help the company deal with any seasonal fluctuation in its working capital requirements;

an **acquisition facility**, which is a line of credit granted by the bank for small future acquisitions;

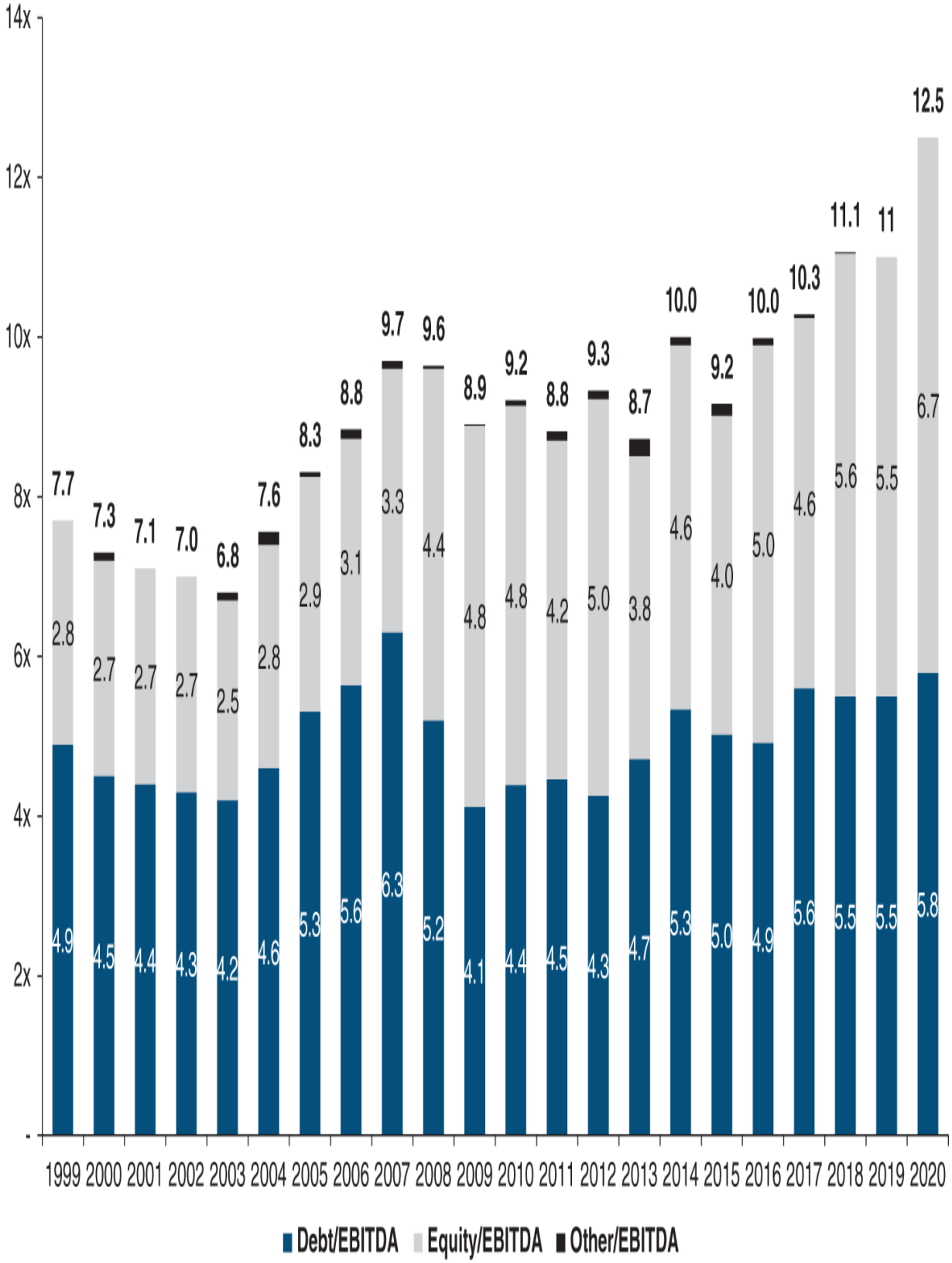
or a **capex facility** to finance capital expenditures.

At the peak of the cycle, where the most complex and inventive structures flourish such as a tranche of bank debt that falls in between senior debt and mezzanine debt – **second lien debt**, which is first-ranking but long-term debt, and **interim facility agreements**, which enable the LBO to go ahead even before the legal paperwork (often running to hundreds of pages) has been finalised and fully negotiated. Interim facility agreements are very short-term debts that are refinanced using LBO loans. “First-loss-second loss” bank loans can complement operations financed by a unitranche debt.

(e) The larger context

The prices of the target companies acquired under LBOs changes in tandem with the evolution of stock market multiples, interest rates, and banks' appetite to lend.

LBO financing ratios to EBITDA in Europe

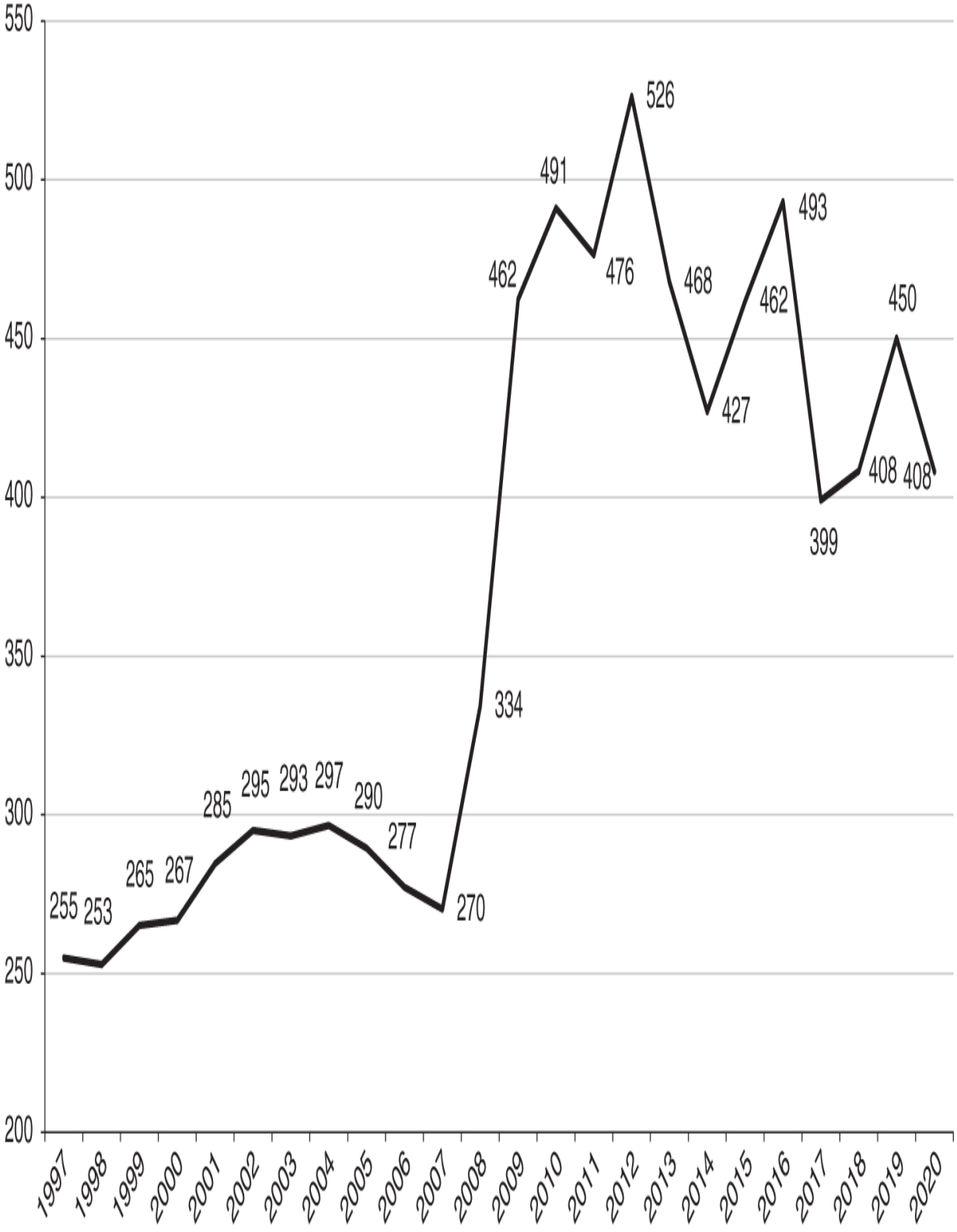


As an example, Wessanen was acquired for 16 times its EBITDA, financed by debt equivalent to 7.7 times its EBITDA.

Source: Data from Standard & Poor's

Since the 2008 crisis, lenders' assessment of the risk of LBOs has been revised upwards considerably, thereby inducing an increase in their required remuneration. Mid-2020 the LBO market has closed over a short period of time but resumed rapidly with a record second half of the year.

Weighted-average spread on senior LBO debt – Tranche B and C in Europe (basis points)



Source: Data from Standard & Poor's

5/ THE EMPLOYEES AND MANAGERS OF A COMPANY UNDER AN LBO

The managers of a company under an LBO may be the historical managers of the company or new managers appointed by the LBO fund. Regardless of their background, they are responsible for implementing a clearly defined business plan that was drawn up with the LBO fund when it took over the target. The business plan makes provision for operational improvements, investment plans and/or disposals, with a focus on cash generation because, as the reader is no doubt aware, cash is what is needed for paying back debts!

LBO funds tend to ask managers to invest large amounts of their own cash in the company (often 1 to 2 years of earnings), and even to take out loans to be able to do so, in order to ensure that management's interests are closely aligned with those of the fund. Investments could be in the form of warrants, convertible bonds or shares, providing managers with a second leverage effect, which, if the business plan bears fruit, will result in a five- to ten-fold or even greater increase in their investment. On the other hand, if the business plan fails, they will lose everything. So, only in the event of success will the management team get a partial share of the capital gains and a higher IRR on its investment than that of the LBO funds. This arrangement is known as the **management incentive package**.

In some cases, following several successful LBOs, the management team can, as a result of this highly motivating remuneration scheme, take control of the company,[8] having seen its initial stake multiplied several times.

More and more often, management teams are advised by a specialised consultancy firm and lawyers for the implementation of these management packages.

Employees are also key to the success of an LBO, which is why some LBO funds have made it a practice to give a small part of their capital gain (usually 2–5%) to employees.

Section 47.3 LBOS AND FINANCIAL THEORY

Experience has shown that LBOs are often done at the same price or at an even higher price than what a trade buyer would be willing to pay. Yet the trade buyer, assuming they plan to unlock industrial and commercial synergies, should be able to pay more. How can we explain the widespread success of LBOs? Do they create value? How can we explain the difference between the pre-LBO value and the LBO purchase price?

At first, we might be tempted to think that there is value created because increased leverage reduces tax payments. But the efficient markets hypothesis casts serious doubts on this explanation, even though financial markets are not, in reality, always perfect. To begin with, the present value of the tax savings generated by the new debt service must be reduced by the present value of bankruptcy costs. Secondly, the arguments in Chapter 33 have led us to believe that the savings might not be so great after all. Hence, the attractions of leverage are not enough to explain the success of the LBO.

We might also think that a new, more dynamic management team will not hesitate to restructure the company to achieve productivity gains and that this would justify the premium. But this would not be consistent with the fact that the LBOs that keep the existing management team create as much value as the others.

Agency theory provides a relevant explanation. The high debt level prompts shareholders to keep a close eye on management. Shareholders will closely monitor operating performance and require in-depth monthly reporting. Management is put under pressure by the threat of bankruptcy if the company does not generate enough cash flow to rapidly pay down debt. At the same time, managers systematically become – either directly or potentially – shareholders themselves via their management package, so they have a strong incentive to manage the company to the best of their abilities.

Management, motivated by a potentially big payoff and put under pressure by a heavy debt burden, will manage the company in the most efficient manner possible, increasing cash flows and hence the value of the company. It's the carrot-and-stick approach!

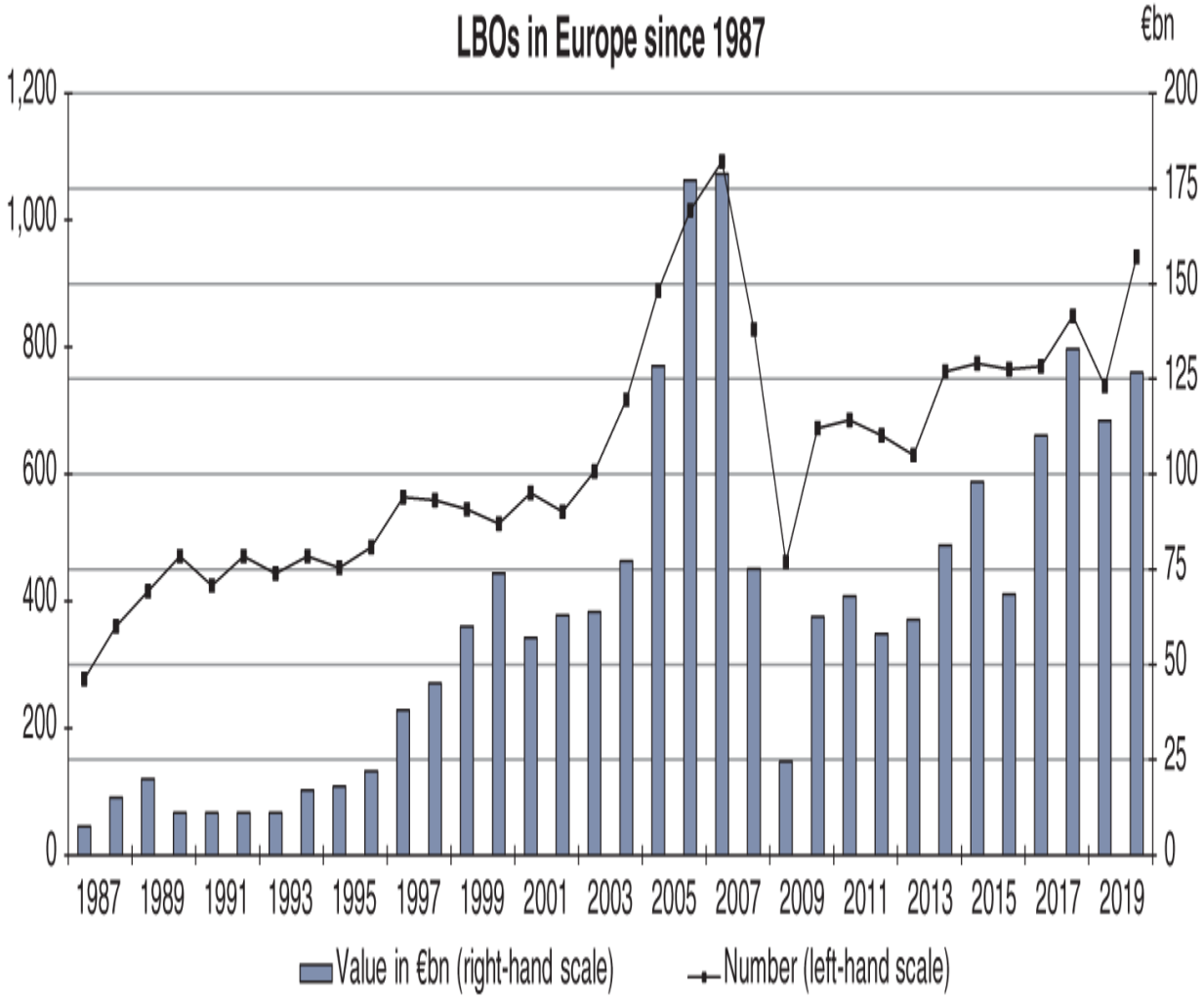
Kaplan has demonstrated through the study of many LBOs that their operating performance, compared with that of peer companies, is much better (cash flow generation, return on capital employed) and that they are able to outgrow the average company and create jobs. This is one example where there is a clear interference of financial structure with operating performance.

LBO transactions greatly reduce agency problems and in so doing create value. Their corporate governance policies are different from those of listed groups and family companies, and in many cases are more efficient.

LBOs give fluidity to markets, helping industrial groups to restructure their portfolio of assets. They play a bigger role than IPOs, which are not always possible (equity markets are regularly shut down) or realistic (small and medium-sized companies in some countries are, in fact, practically banned from the stock exchange).

Section 47.4 THE LBO MARKET: A WELL-ESTABLISHED MARKET

While LBOs have grown considerably in Europe since the 1980s, this growth has been highly cyclical. It is highly dependent on lenders' appetite for risky debt, without which LBOs cannot take place, and on economic conditions that suggest that the debt contracted will be repaid by the cash flows generated and/or the resale of the company under LBO. There is therefore an alternation, with the regularity of a metronome, between phases of expansion (late 1990s, 2003–2007, 2014–2019) and contraction (early 1990s, 2000–2003, 2008–2013, 2020).



Source: Data from CMBOR / Equistone Partners Europe, Mergermarket

The debt to EBITDA ratios are reduced and inflated, covenants are more or less strict, A tranches (repaid on a straight-line basis and not at the end) provide a more or less significant part of the debt repayment, making LBO financing more like asset financing (when the vast majority of the repayment comes from the resale of the company under LBO), or rather cash flow financing, which is what they were supposed to be when LBOs were invented.

In 2020, as in 2008–2013, companies under LBO suffered the consequences of a decline in activity coupled with high debt levels. Nevertheless, the rapid recovery of activity in 2021 gives reason to hope that, in most sectors, equity will be sufficient to absorb the business losses of 2020.

The intrinsic strengths of LBOs in corporate governance mean that they are crisis-proof; they have shown their resilience in 2020–2021.

The intrinsic advantages of LBOs in terms of corporate governance mean that they got through this crisis as they will future crises. They will not become extinct, but will experience regular eclipses, such as that which started in early 2020.

SUMMARY

The summary of this chapter can be downloaded from www.vernimmen.com.

A leveraged buyout is a transaction whereby the purchase of a company is financed primarily with borrowed funds. A holding company contracts the debt and purchases the target company. The company's cash flow is regularly funnelled upstream to the holding company via dividends to enable the latter to pay interest and reimburse the loans.

Although initially, an LBO was often a solution in a family succession situation or when a large group wanted to sell off a division, it is increasingly a form of ownership in itself; a company being bought and sold by different LBO funds. It can also be a way for a company to delist itself when it is undervalued in the market.

The target company in an LBO may keep the current management in place or hire a new management team. Equity capital is provided by specialised funds, the LBO funds. The structure depends on several layers of debt – senior, junior or subordinate or mezzanine – with different repayment priorities. As priority declines, risk and expected returns increase.

Increased gearing and the deductibility of interest expense do not satisfactorily explain why value is created in an LBO. Instead, it appears that the heavier debt burden motivates management to do a better job managing the company, of which they are often destined to become shareholders themselves. This is agency theory in action. LBO funds bring different and, most of the time, more efficient corporate governance policies than those of family companies or listed groups: they focus management teams on cash flow generation and value creation. This is why a company can remain under an LBO for years, with one LBO fund selling it to another.

QUESTIONS

1/Explain why an LBO is a type of capital reduction.

2/What risks are involved in an LBO?

3/Can mezzanine financing in the context of an LBO be compared with equity or debt?

4/In the context of an LBO, does the holder of senior debt take more or less risk than the holder of junior debt?

5/Can an LBO be carried out on a start-up company?

6/In a secondary LBO, can an LBO fund accept that the management team does not reinvest a significant part of the capital gains achieved on the first LBO in the new LBO? Why?

7/What are the different possible exit routes after an LBO?

8/How does corporate governance of an LBO differ from that of a listed company with no major shareholder?

9/How does corporate governance of an LBO differ from that of most unlisted family companies?

10/What are the pros and cons of being a shareholder of a listed LBO fund compared to being a shareholder of a private one?

11/What are the three types of risks that the shareholder of an LBO fund runs?

12/Can an LBO work without debt?

13/Can someone remain an LBO manager for more than 10 years?

You'll find more questions at www.vernimmen.com.

ANSWERS

Questions

1/*Because shareholders' equity is mostly replaced by debt.*

2/*The risk that debts will outweigh cash flows generated.*

3/*With debt, because sooner or later it has to be repaid.*

4/*Less risk, because the holder of senior debt is repaid before the holder of junior debt.*

5/*No, because a start-up company's cash flows are much too volatile to allow it to carry debt.*

6/*No, an LBO fund requires around 50% of the capital gains to be reinvested to keep management's motivation high.*

7/*IPO, sale to a trade buyer, a secondary buyout, bankruptcy, a recapitalisation.*

8/*Strong financial incentives for managers, constraint of the debt to be paid down, regular business discussions with shareholders (LBO fund representatives).*

9/*Meritocracy is the rule of the game, not being a member of the founding family.*

10/*The share of the LBO fund can be sold on the market, but it trades at a significant discount to the net asset value.*

11/*Business risk, financial risk linked to the highly geared structure, risk linked to the lack of liquidity of the investment.*

12/*No, as there is neither the pressure linked to the debt burden nor the hope for very high returns thanks to the leverage.*

13/*No, as it would mean very high pressure for a very long time, and lack of motivation as the managers would normally have already become very rich.*

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NOTES

1 *We have based this example on publicly available information, and for some of the figures have either simplified the reality or made some estimates. It should be considered as illustrative and does not reflect the reality or the exact state of the company.*

2 *Assuming 100% payout.*

3 *Assuming tax consolidation treatment.*

4 *Pension funds, insurance companies, banks, sovereign wealth funds.*

5 *Just before the LBO market ground to a sudden halt.*

6 *Earnings before interest, taxes, depreciation and amortisation. For more, see Chapter 3.*

7 *Section 20.1.*

8 *Of small or medium size; Fives is an example.*

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Chapter 48
BANKRUPTCY AND RESTRUCTURING

Women and children first!

Every economic system needs mechanisms to ensure the optimal use of resources. Bankruptcy is the primary instrument for reallocating means of production from inefficient to efficient firms.

> Theoretically, bankruptcy shakes out the bad apples from sectors in difficulty and allows profitable groups to prosper. Without efficient bankruptcy procedures, financial crises are longer and deeper.

A bankruptcy process can allow a company to reorganise, often requiring asset sales, a change in ownership and partial debt forgiveness on the part of creditors. In other cases, bankruptcy leads to liquidation – the death of the company.

Generally speaking, bankruptcy is triggered when a company can no longer meet its short-term commitments and thus faces a liquidity crisis. This does not necessarily lead to bankruptcy. Nevertheless, the exact definition of the financial distress leading the company to file for bankruptcy may differ from one jurisdiction to another.

Bankruptcy is a critical juncture in the life of the firm. Not only does the bankruptcy require that each of the company's stakeholders make specific choices, but the very possibility of bankruptcy has an impact on the investment and financing strategies of healthy companies.

Section 48.1 CAUSES OF BANKRUPTCY

> Companies do not encounter financial difficulties because they have too much debt, but because they are not profitable enough. A heavy debt burden does no more than accelerate financial difficulties.

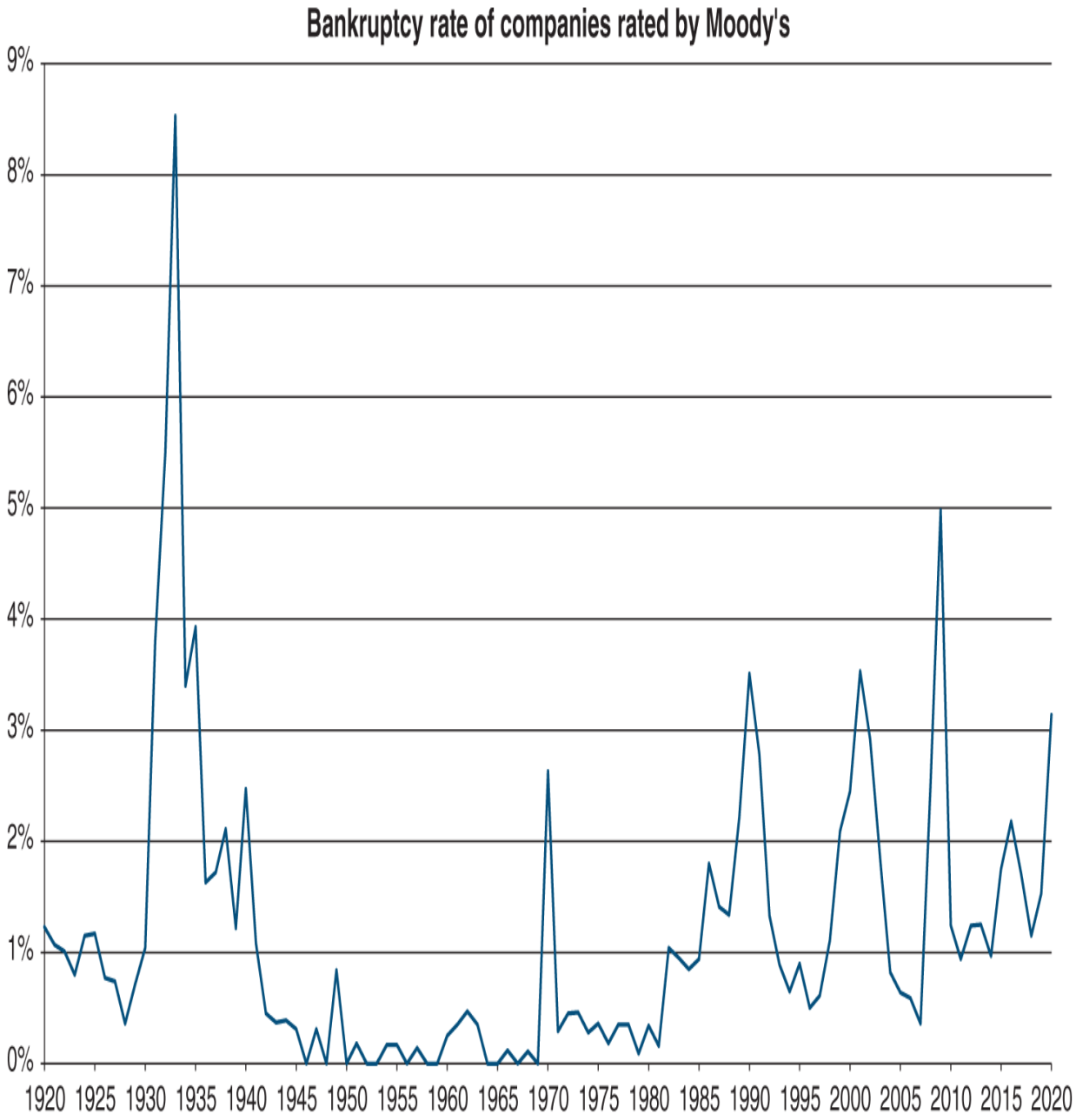
The problems generally stem from an ill-conceived strategy, or because that strategy is not implemented properly for its sector (costs are too high, for example). As a result, profitability falls short of creditor expectations. If the company does not have a heavy debt burden, it can limp along for a certain period of time. Otherwise, financial difficulties rapidly start appearing.

Generally speaking, financial difficulties result either from a market problem, a cost problem or a combination of the two. The company may have been caught unawares by market changes and its products might not suit market demands (e.g. Virgin Megastore, a book and disk retailer, Silicon Graphics). Alternatively, the market may be too small for the number of companies competing in it (e.g. crowdlending platforms in various countries). Ballooning costs compared with those of rivals can also lead to bankruptcy. General Motors, for example, was uncompetitive against other carmakers. Eurotunnel, meanwhile, spent twice the budgeted amount on digging the tunnel between France and the UK.

Nevertheless, a profitable company can encounter financial difficulties, too. For example, if a company's debt is primarily short term, it may have trouble rolling it over if liquidity is lacking on the financial markets. In this case, the most rational solution is to restructure the company's debt.

One of the fundamental goals of financial analysis as it is practised in commercial banks, whose main business is making loans to companies, is to identify the companies most likely to go belly up in the near or medium term and not lend to them. Numerous standardised tools have been developed to help banks identify bankruptcy risks as early as possible. This is the goal of credit scoring, which we analysed in Section 8.7.

Rating agencies also estimate the probability that a company will go bankrupt in the short or long term (bankruptcies as a function of rating were presented in Section 20.6).



Source: Data from Moody's, 2021

Section 48.2 THE DIFFERENT BANKRUPTCY PROCEDURES

The bankruptcy process is one of the legal mechanisms that is the least standardised and homogenised around the world. Virtually all countries have different systems. In addition, legislation is generally recent and evolves rapidly.

Nevertheless, among the different procedures, some patterns can be found. In a nutshell, there are two different types of bankruptcy procedure. The process will be either “creditor (lender) friendly” or “debtor (company) friendly”. But all processes have the same ultimate goals, although they may rank differently:

paying down the liabilities of the firm;

minimising the disruptive impact on the industry;

minimising the social impact.

A creditor-oriented process clearly sets the reimbursement of creditors as the main target of the bankruptcy process. In addition, the seniority of debt is of high importance and is therefore recognised in the procedure. In this type of procedure, creditors gain control, or at least retain substantial powers in the process. This type of process generally results in the liquidation of the firm. The bankruptcy procedure in the UK clearly falls into this category.

Such a regulation may seem unfair and too tough, but it aims to prevent financial distress rather than solving it in the least disruptive way for the whole economy. In such countries, firms exercise a kind of self-discipline and tend to keep their level of debt reasonable in order to avoid financial distress. As a counterpart, creditors are more confident when granting loans, and money is more readily available to companies. For those supporting this type of process, the smaller number of bankruptcies in countries with stringent regulations (and an efficient judicial system) is evidence that this self-regulation works.

At the other end of the spectrum, some jurisdictions will give the maximum chance to the company to restructure. These procedures will generally allow management to stay in place and give sufficient time to come up with a restructuring plan. Countries with this approach include the USA (Chapter 11) and France.

The difference between the two approaches is reflected in the shorter duration of proceedings in creditor-friendly systems (1 year in the UK, 1.2 years in Germany) than in countries favouring business continuity (1.9 years in France).

The transposition of the European directive on bankruptcy prevention should partially converge the approaches to bankruptcy. Inspired by French prevention law, it should nevertheless give more power to creditors in the most debtor friendly countries (e.g. France).

To summarise, the following criteria help define a bankruptcy procedure:

Does the procedure allow restructuring or does it systematically lead to liquidation (most jurisdictions design two distinct procedures)?

Does management stay in place or not?

Does the procedure include secured debts? In some countries, secured debts (i.e. debts that are guaranteed by specific assets) and related assets are excluded from the process and treated separately, allowing greater certainty in the repayment. In such countries, securing a debt by a pledge on an asset gives strong guarantees.

Do creditors take the lead, or at least have a say in the outcome of the process? In most jurisdictions, creditors vote on the plan that is proposed to them as the outcome of the bankruptcy process. They sometimes have even greater power and are allowed to name a trustee who will liquidate the assets to pay down debt. But in some countries (e.g. France) they are generally not even consulted.

	France	**Germany**	**India**	**Italy**	**UK**	**USA**
Type	Debtor (borrower) friendly	Creditor (lender) friendly	Creditor (lender) friendly	Debtor (borrower) friendly	Creditor (lender) friendly	Debtor (borrower) friendly
Possible restructuring	Yes	Yes (rare)	Yes	Yes	Rare after opening of a proceeding	Yes
Management can stay in place	Yes*	Yes*	No	***	No	Yes
Lenders vote on restructuring/liquidation plan	No	Yes	Yes	Yes**	Yes	Yes
Priority rule	Salaries; tax, other social liabilities; part of secured debts; proceeding charges; other secured debts; other debts	Proceeding charges; secured debts; other debts	Secured debts and employee proceeding charges; tax and social liabilities; unsecured debts	Proceeding charges; preferential creditors (inc. tax and social) and secured creditors; unsecured creditors	Proceeding charges; secured debts on specific assets; tax and social security; other secured debts; other debts	Secured debts granted after filing; employee benefit and tax claims; unsecured debts

* Assisted by court-designated trustee.

** Yes in the case of restructuring (pre-emptive arrangement) but only consultative committee in case of liquidation.

*** No in the case of liquidation.

Recasens (2001) has demonstrated that a creditor-orientated process is the most efficient. He reaches this conclusion after having compared the US system (debtor friendly) and the Canadian one (creditor friendly) on the basis of:

the length and cost of the liquidation;

the recovery rate according to seniority ranking;

the risk of allowing a non-viable company to restructure and the risk of liquidating an efficient company.

He has noticed that creditor-orientated processes increase the debt offer. As a matter of fact, it is logical that the offering of debt will be less abundant in countries where lenders are badly treated in case of difficulties experienced by their borrowers. Davydenko and Franks (2008) have demonstrated that British lenders recover 20% more on their claims than their French counterparts.

Claessens and Klapper (2002) have shown that the number of bankruptcies is greater in countries with mature financial markets. The proposed explanation is that, in those countries, companies are more likely to have public or syndicated debt and therefore a large number of creditors. In addition, with sophisticated markets, firms are more likely to have several types of debt: secured loans, senior debt, convertibles, subordinated, etc. In this context it may appear to be very difficult to restructure the firm privately (i.e. to find an agreement with a large number of parties with often conflicting interests such as hedge funds, vulture funds, trade suppliers, commercial banks, etc.), hence a bankruptcy process is the favoured route.

This is especially true when a lender has already hedged itself though a credit default swap[1] and will earn more from bankruptcy (recover 100% of its claims thanks to the CDS) than in a reorganisation (will get less than 100%).

In bank-financing-based countries, firms have strong relationships with banks. In the case of financial distress, banks are likely to organise the restructuring privately. This is often the case in Germany or in France, where bilateral relationships between banks and corporates are stronger than in the anglosphere.

Section 48.3 BANKRUPTCY AND FINANCIAL THEORY

1/ THE EFFICIENT MARKETS HYPOTHESIS

In the efficient markets hypothesis, bankruptcy is nothing more than a reallocation of assets and liabilities to more efficient companies. It should not have an impact on investor wealth, because investors all hold perfectly diversified portfolios. Bankruptcy, therefore, is simply a reallocation of the portfolio.

The reality of bankruptcy is, however, much more complicated than a simple redistribution. Bankruptcy costs amount to a significant percentage of the total value of the company. By bankruptcy costs, we mean not only the direct costs, such as the cost of court proceedings, but also the indirect costs. These include loss of credibility vis-à-vis customers and suppliers, loss of certain business opportunities, etc. Almeida and Philippon have estimated that bankruptcy costs range at 4.5% of the enterprise value of the company (see Section 33.1).

2/ SIGNAL THEORY AND AGENCY THEORY

The possibility of bankruptcy is a key element of signalling theory. An aggressive borrowing strategy sends a positive signal to the market, because company managers are showing their belief that future cash flows will be sufficient to meet the company's commitments. But this signal is credible only because there is also the threat of sanctions: if managers are wrong, the company goes bankrupt and incurs the related costs.

Moreover, conflicts between shareholders and creditors, as predicted by agency theory, appear only when the company is close to the financial precipice. When the company is in good health, creditors are indifferent to shareholder decisions. But any decision that makes bankruptcy more likely, even if this decision is highly likely to create value overall for the company, will be perceived negatively by the creditors.

Let's look at an example. Rainbow Ltd manufactures umbrellas and is expected to generate just one cash flow. To avoid having to calculate present values, we assume the company will receive the cash flow tomorrow. Tomorrow's cash flow will be one of two values, depending on the weather. Rainbow has borrowings and will have to pay 50 to its creditors tomorrow (principal and interest).

Weather	Rain	Shine
Cash flow	100	50
Payment of principal and interest	−50	−50
Shareholders' portion of cash flow (equity)	50	0

Rainbow now has an investment opportunity requiring an outlay of 40 and returning cash flow of 100 in case of rainy weather and −10 in case of sunny weather. The investment project appears to have a positive net present value. Let's see what happens if the investment is financed with additional borrowings.

Weather	Rain	Shine
Cash flow	200	40
Payment of principal and interest	−90	−40

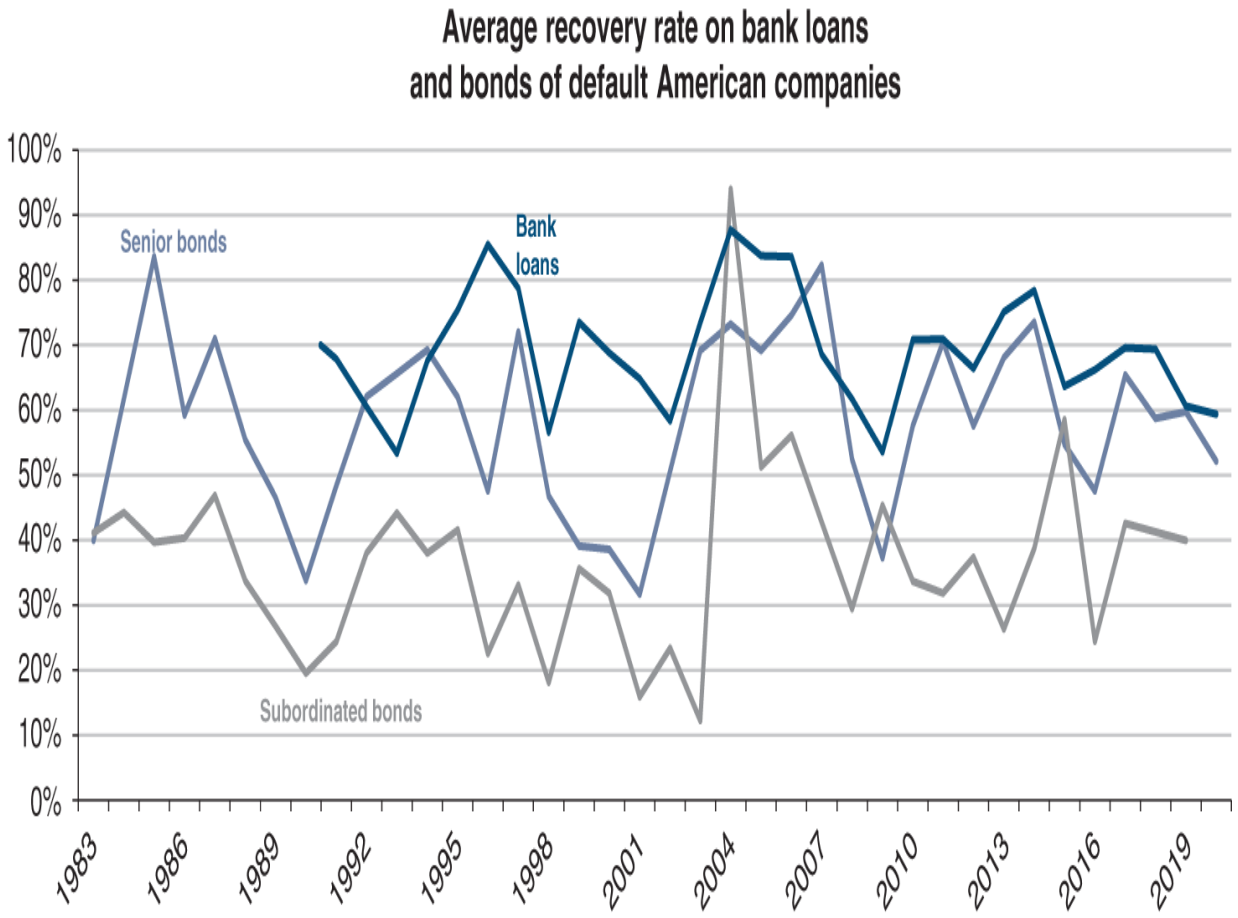
		(whereas 90 was due)
Shareholders' portion of cash flow (equity)	110	0

Even though the investment project has a positive net present value, Rainbow's creditors will oppose the project because it endangers the repayment of part of their loans. Shareholders will, of course, try to undertake risky projects as it will more than double the value of the equity.

It can be demonstrated that when a company is close to bankruptcy, all financial decisions constitute a potential transfer of value between shareholders and creditors. Any decision that increases the company's overall risk profile (risky investment project, increase in debt coupled with a share buy-back) will transfer value from creditors to shareholders. Decisions that lower the risk of the company (e.g. capital increase) will transfer value from shareholders to creditors. As we showed in Chapter 34, these value transfers can be modelled using options theory.

Conflicts between shareholders and creditors and between senior and junior creditors also influence the decisions taken when the company is already in bankruptcy. On the one hand, creditors want to accelerate the procedure and liquidate assets quickly, because the value of assets rapidly decreases when the company is “in the tank”. On the other hand, shareholders and managers want to avoid liquidation for as long as possible because it signifies the end of all hope of turning the company around, without any financial reward. For managers, it means they will lose their jobs and their reputations will suffer. At the same time, managers, shareholders and creditors would all like to avoid the inefficiencies linked with liquidation. This common objective can make their disparate interests converge.

The table below shows the average hope for repayment in the case of bankruptcy, depending on the ranking of the debt.



Whereas US senior creditors get, on average, 60% of their money back, most junior creditors will receive around 40% of their initial lending.

Source: Data from Moody's Global Credit Policy, January 2021

Lastly, a company in financial difficulties gives rise to the free-rider problem (see Section 26.3). For example, a small bank participating in a large syndicated loan may prefer to see the other banks renegotiate their loans, while keeping the terms of its loan unchanged.

3/ THE LIMITS OF LIMITED LIABILITY

Modern economies are based largely on the concept of limited liability, under which a shareholder's commitment can never exceed the amount invested in the company. It is this rule that gives rise to the conflicts between creditors and shareholders and all other theoretical ramifications on this theme (agency theory).

In bankruptcy, managers can be required to cover liabilities in the event of gross negligence. In such cases, they can be forced to pay back creditors out of their own pockets, once the value of the company's assets is exhausted. So, when majority shareholders are also the managers of the company, their responsibility is no longer limited to their investment. Such cases are outside the framework of the pure financial decision situations we have studied here.

Section 48.4 RESTRUCTURING PLANS

Restructurings concern companies that are considered to be viable, subject to certain conditions, often requiring operational changes in management, strategy, scope, production or marketing methods, etc.

Additionally, their capital structure must be adapted to a new environment because these companies, although they may be viable, do not and will not generate sufficient cash flows over a foreseeable period in order to cope with their current debts. Accordingly, these debts must be reduced one way or another, leading to sacrifices for lenders, who in turn will only agree to do so if shareholders also make an effort.

When a company is simply in breach of a covenant (see Section 39.2), it will negotiate a waiver with its banks, most of the time in exchange for a commission of 0.1% to 1% of the total debt (waiver fee) and a rise in the margins on the loans, the risk of which has increased.

If the company realises that it is not going to be able to meet the next repayment on its loan, it is strongly advised, with the help of an advisor, to commence private negotiations, known as private workouts, with its creditors. The more numerous the company's sources of funding – common shareholders, preferred shareholders, convertible bondholders, creditors, etc. – the more complex the negotiations.

The business plan submitted by the company in financial distress is a key element in estimating its ability to generate the cash flows needed to pay off creditors, partly or totally according to the seniority of their claims. It is usually validated through an independent business review (IBR), carried out by a specialist firm.

A restructuring plan requires sacrifices from all of the company's stakeholders. It generally includes a recapitalisation, often funded primarily by the company's existing shareholders or by new shareholders who can thus take control over the company, and a renegotiation of the company's debt. Creditors are often asked to give up some of their claims, accept a moratorium on interest payments and/or reschedule principal payments or accept a swap of part of their debts into equity of the borrower.

The parties naturally have diverging interests, with each one seeking to minimise the reductions in value that it will have to agree to in order to enable the company to achieve a capital structure in line with economic conditions that have deteriorated.

The shareholders, who have already lost a lot of money, only want to put in a minimum amount of new equity, as long as an overall agreement can be reached and as long as they are confident in the company's ability to turn itself around. Sometimes they are unable to put in any money as they have no resources (for example, LBO funds at the end of their lives).

Lenders are, in theory, in a strong position thanks to the guarantees that they may have insisted on or their ability to take control of the company by converting part of their debts into shares in the case of an insolvency plan or court-ordered administration. In practice, they are not always keen or able to become shareholders, since this often involves providing new funds to finance the operational restructuring, which is a particularly risky investment. But under a debtor-friendly system, it is not always clear who has the upper hand, since the aim of the lawmakers is first and foremost the preservation of the company and its jobs, not the preservation of the creditors.

Creditors and shareholders are naturally at odds with each other in a restructuring. To bring them all on board, the renegotiated debt agreements sometimes include clawback provisions, whereby the principal initially foregone will be repaid if the company's future profits exceed a certain level. Alternatively, creditors might be granted share warrants. If the restructuring is successful, warrants enable the creditors to reap part of the benefits.

This whole context explains that most restructuring negotiations finish in the early morning, after several all-night negotiating sessions, break-offs and unexpected dramatic turns in events. They end because there is a deadline which forces the parties to reach an agreement! To succeed, financial restructuring must be accompanied by operational restructuring allowing the return to a normal level of return on capital employed. Needless to say, it is the most important one! Working capital will have to be reduced as well as headcount, certain businesses might be sold or discontinued. Note that restructuring a company in difficulty can sometimes be a vicious circle. Faced with a liquidity crisis, the company must sell off its most profitable operations. But as it must do so quickly, it sells them for less than their fair value. The profitability of the remaining assets is therefore impaired, paving the way to new financial difficulties.

SUMMARY

The summary of this chapter can be downloaded from www.vernimmen.com.

Bankruptcy is triggered when a company can no longer meet its short-term commitments and thus faces a liquidity crisis. This situation does not arise because the company has too much debt, but because it is not profitable enough. A heavy debt burden does no more than hasten the onset of financial difficulties.

The bankruptcy process is one of the legal mechanisms that is the least standardised and homogenised around the world. Virtually all countries have a different system. Depending on the country, the process will be either “creditor (lender) friendly” (United Kingdom, Germany, Spain) or “debtor (company) friendly” (France, Italy, United States). But all processes have the same goals, although they might rank differently:

paying down the liabilities of the firm;

minimising the disruptive impact on the industry;

minimising the social impact.

The bankruptcy process can generate two types of inefficiencies:

allowing restructuring of an inefficient firm that destroys value;

initiating the liquidation of efficient companies.

Prior to court proceedings, a company experiencing financial difficulties can try to implement a restructuring plan. The plan generally includes a recapitalisation and renegotiation of the company's debt.

Bankruptcy generates both direct costs (court proceedings, lawyers, fees, etc.) and indirect costs (loss of credibility vis-à-vis customers and suppliers, loss of certain business opportunities, etc.). These costs have an impact on a company's choice of financial structure.

Financial distress will generate conflict between shareholders and creditors (agency theory) and conflict among creditors (free-rider issues).

QUESTIONS

1/Why do companies go bankrupt?

2/What risks do you take if you buy a subsidiary of a group that you know is in financial distress?

3/Do the same types of conflict arise in the event of the bankruptcy of a partnership and that of a limited company? Why?

4/How, in some countries, can bankruptcy play a role in the survival of the company?

5/How do bankruptcy costs impact on the tax breaks available on debt?

6/Why are companies that are emerging from bankruptcy proceedings often strong competitors?

7/Why are companies in France that are emerging from bankruptcy proceedings rarely strong competitors?

8/Can a company with no debts go bankrupt? Can it destroy value?

9/Why is a company able to get back on its feet financially during the bankruptcy period?

10/Why do creditors agree to grant loans to companies during the bankruptcy period?

11/What are the pros of a creditor-friendly bankruptcy procedure for shareholders?

12/Name countries which have debtor-friendly bankruptcy procedures.

You'll find more questions at www.vernimmen.com.

EXERCISES

1/The Landmark car park will be shutting down tomorrow after having generated a final cash flow. It has debts of 500 used to finance its activities. Depending on whether the economic situation is good or bad (there is an equal probability of either), the flows are as follows:

Economic situation	−	+
Operating cash flow	500	1,000
Payment of debt	−500	−500
Shareholders' portion of cash flow	0	500

The company is offered an investment yielding 0 if things go badly (−) and 300 if things go well (+).

What is the initial value of the debt? And of shareholders' equity?

What is the present value of the investment project? At what price would shareholders agree the company to acquire it? Does your answer depend on the way this investment is financed?

What conditions would new creditors set for financing this new investment?

Are conflicts that arise between shareholders and creditors a result of the way in which the company finances investments?

2/Alok Malpani and Sons is a high-tech group in financial distress. Its key financials are as follows:

(€m)	2018	2019	2020
Sales	8,026	5,208	3,018
Operating income	130	(168)	(100)
Financial expense	(330)	(144)	(62)
Restructuring costs	(1,020)	(314)	(0)
Net income	(1,220)	(626)	(162)
Fixed assets		122	72
Working capital		614	330
Shareholders' equity		(620)	(784)
Subordinated debt		616	616
Senior debt		740	570

Alok Malpani and Sons shares are trading at €24. The company's share capital is divided into 8,910,000 shares. The value of the senior debt can be estimated at half of its face value and the value of the subordinated debt at 21% of its face value.

The following rescue plan has been submitted to all of the investors in the company:

Shareholder subscription to a capital increase of 15,500,000 new shares at a price of €20 per share, totalling €310m.

Partial repayment and conversion of the subordinated debt into capital: issue of 3,850,000 new shares and repayment of €36.96m.

Waiver of €160m of debts by senior creditors. In exchange, 1,250,000 warrants entitling holders to subscribe after three years to 1 share per warrant at a price of €25 per share. The value of these warrants is estimated at €4 per warrant. The proceeds of the capital increase that are left over after partial repayment of the subordinated debt will be used to repay the senior creditors.

What is your view of the financial health of this company?

Calculate the value of the different securities used to finance the capital employed.

Calculate how much the various lenders will have before and after the rescue plan. Assume the negotiated amount of the face value of the senior debt will be 80% after the plan.

Who are the key beneficiaries of this plan?

ANSWERS

Questions

1/*Because their return on capital employed is too low and they do not generate enough free cash flow.*

2/*The risk that the sale may be declared invalid, as it took place during the period immediately preceding the bankruptcy.*

3/*No, because in partnerships, partners' liability is not limited to their contributions.*

4/*It puts the counter back to zero for all contracts.*

5/*The present value of the cost of bankruptcy is deducted from the enterprise value. The more debts a company has, the higher the tax shield but also the higher bankruptcy costs.*

6/*Because a portion of their charges may have been renegotiated and revised downwards (rent, personnel expenses, miscellaneous charges).*

7/*Because in France, public policy is weighted heavily in favour of job preservation, and the recovery plan that saves the largest number of jobs is likely to be the one selected by the bankruptcy courts, even if, in the long term, it leads to the demise of the company.*

8/*No, since it doesn't owe anything (or practically nothing). Yes, if it invests at a rate of return below that required by shareholders.*

9/*Because in most jurisdictions, repayments on old debts are frozen and customers continue to pay their debts.*

10/*Because their new debts will be paid off before the old debts if the company is liquidated (so-called new money privilege).*

11/*Managers will try to postpone bankruptcy for as long as possible.*

12/*USA, France.*

Exercises

A detailed Excel version of the solutions is available at www.vernimmen.com.

1/

$V_D = 500, V_E = 250.$

150; up to 300 if it is debt financed as no value will be destroyed (in the + case: +300 of operating cash flow and 300 debt to repay, unchanged free cash flows to equity in the – case); 150 if it is equity financed.

They would want to be certain that they will be reimbursed first (i.e. their credit is ranked higher than that of existing creditors).

Yes, but only because the company was close to bankruptcy at the outset.

2/

The group is in very poor shape financially, and its returns are far too low. The disposal of the most attractive assets that became necessary to meet cash needs merely served to accelerate the group's plunge into bankruptcy. The business is shrinking away.

Value of shareholders' equity = €213.84m.

Value of subordinated debt = €129.36m.

Value of senior debt = €285m.

Value of capital employed = €628.2m.

Value of senior creditors' assets = (310 − 36.94) + (570 − 160 − 310 + 36.94) × 80% + 1.25 × 4 = €387.61m.

Value of shareholders' equity = 628.2 − (570 − 160 − 310 + 36.94) × 80% − 1.25 × 4 = 513.65.

Value of a share = 513.65 / (8.91 + 15.5 + 3.85) = €18.2.

Shareholders' wealth without capital increase = €162.2m (compared with €213.83m before plan).

Subordinated creditors' assets = 36.94 + 3.85 × 18.2 = €107m (compared with €129.36m before).

Wealth of shareholders who subscribed to the capital increase = 15.5 × 18.2 = €282.1m (for €310m invested).

The creditors.

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NOTE

1 *For more, see Section 51.3.*

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PART TWO
MANAGING WORKING CAPITAL, CASH FLOWS, FINANCIAL RISKS AND REAL ESTATE

In this section, readers will understand that what may at first glance appear to be of little interest is in fact crucial for the sound financial management of a firm. The management of flows is one of the elements that optimise working capital and the reduction of capital employed by the firm. It makes it possible to “track cash”, which is an advance indicator of results and of potential operational problems. Management of financial risks is essential in a complex and volatile world in order to prevent such risks impacting on the firm, or threatening its development or even its survival. Finally, managing real estate, especially operating real estate, can be a strategic matter for some firms.

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Chapter 49
MANAGING WORKING CAPITAL

Is it supply chain management or is it strategy? It's finance, General!

On aggregate in Continental Europe, working capital represents large amounts (c. 15% on capital employed). Customer credits (and symmetrically, supplier credits), which are commercial loans between companies, amount to nearly three times the amount of short-term loans granted to corporates.

The similarity between the amount of working capital and that of net debt is not completely coincidental, as often these two items behave in concert. An increase in working capital means an increase in net debt, as a large number of companies can testify following their experiences in late 2020. A drop in working capital often means a drop in net debt, as a large number of companies can testify following their experiences in mid-2020.

> Having said that, working capital management does not involve reducing it at all costs in a simplistic fashion, as it also contributes to the overall equilibrium of the company. This is an often overlooked fact.

Finally, the problems and the amounts of working capital are not identical for all sectors. There is a world of difference between industry (management of work-in-progress, credit limits for major customers, etc.) and the services sector.

Section 49.1 A BIT OF COMMON SENSE

Working capital is an investment, like any other, even if on occasion there is less choice involved (for example, when a customer “forgets” to pay by the due date and turns the supplier into its unwilling banker). As an investment, it should be managed lucidly and properly. Reducing it in order to reduce the company's need for funds and to improve its earnings is a possibility, but it is not the only possibility.

1/ THE NUMEROUS ASPECTS OF WORKING CAPITAL

From the company's point of view, what is working capital?

First and foremost, it's part of commercial conquest. We all know that payment periods form part of the terms of a commercial contract. Try to set up a business in Greece, where contractual payment periods are 53 days with average periods often stretching to 69 days, by asking to be paid at 25 days like in the Netherlands! Similarly, keeping stock levels high reduces the risk of losing an order because supplies are not available. Consumers will remember the sense of annoyance and frustration felt in March of 2020 at the empty toilet paper shelves of a number of retailers.[1]

Next, it's a source of financing when it reduces and a source of financing requirement when it increases. One might be tempted to assume that the stakes are not the same when the very short-term interest rates stand at 0% or even negative, as they did in 2016–2021, or at 10% per year, as they did between 1990 and 1993.[2] This is a false assumption. The problem is not so much the cost of money as it is making money available by reducing working capital in order to invest, to repay debt or to constitute a war chest. The problem is also not having money when the company needs it. In other words, managing working capital is a timeless problem, even if some situations are better than others for highlighting the issue.

Finally, it is a source of risk: the risk that customers will pay late or will only pay partially or not at all because they have gone bankrupt, which could in turn create problems for the company and create a series of domino-like bankruptcies. It is to alleviate this risk that the European authorities have introduced statutory provisions to reduce payment periods to 60 days (or by way of exception 45 days end of month) after the invoice is issued. There is also the risk of the loss of value for obsolescence of certain goods (news journals, cut flowers, yoghurt, etc.).

From a more economic point of view, working capital can be:

A tool for helping customers or suppliers who are already experiencing problems as a result of a liquidity crisis. For example, in March–April 2020, some large groups as L'Oréal, with ample cash resources, in turn helped their main subcontractors, who were experiencing a liquidity crisis, by reducing their payment periods. This was not only a question of altruism, it was also in their best interest, in order to avoid the bankruptcy of their suppliers, which would have threatened the continuity of their supplies.

A source of value creation in periods of negative real interest rates and significant inflation, for sectors with high levels of inventories, through inflation gains.[3] In other words, good management of working capital in this case means not managing it!

A source of speculation (and hence of risk) when the company overstocks raw materials, the price of which it is expecting will rise substantially over the coming months (electronic components end 2020–beginning 2021).

Working capital results from the company's strategy. For example, when a company decides to get involved upstream in order to secure its supplies (ArcelorMittal owns iron-ore mines that provide it with 65% of its consumption), or downstream in order to fill the gaps in a retail network that is patchy or not yet established (SEB runs close to 1,300 shops in 45 emerging countries such as China, Turkey), then working capital is necessarily increased. Similarly, when the company decides, like Indesit did, to outsource part of its production to Eastern Europe, South East Asia or China, then margins rise (or don't fall), but working capital increases, since these subcontractors just don't have the financial structure necessary to grant Greek-style payment periods![4]

The level of working capital is also the result of a financial arbitrage between margins and costs. We know of a magazine group that pays cash for its paper supplies. It is able to purchase its paper at a knock-down price, as it is in a very good position to negotiate discounts at a higher rate than that at which it could invest its cash, from suppliers whose need for cash is constant given the extent of their investments. Our magazine publisher's working capital is mediocre (practically no supplier credit), but its margins are outstanding!

Another example is the public works sector, which is structured around customer advances that more or less cover the cost of the works, and more, for the best of them. Working capital is low, but then so are margins. You can't expect your customer to give you everything!

> In other words, you can buy cash.

The company grants discounts so that customers will pay quickly, which means that working capital level is low and that cash is quite plentiful but also that margins will decline. This is why in the USA it is standard to offer customers the option of paying at 30 days or of paying at 10 days and getting a 2% discount. As the yield to maturity of this commercial offer is 44.6%, very few buyers are able to resist the temptation! (And those who do send out a signal of a pitiful financial situation which may alarm suppliers.) Sales, when they are exceptional, are also a way of buying cash.

> The cursor will often depend on the economic climate. In periods of crisis, cash will be king and, accordingly, working capital will be managed very tightly. When times are good, the focus will be on growing sales and margins, at the expense of working capital.

2/ MANAGING WORKING CAPITAL

There are four ways of approaching working capital management:

tighten control over waste: stop the payments department from paying suppliers early, sell off stocks with low turnover rates and consider phasing out the production of such items. These measures are relatively easy to put in place and will not require a major overhaul of the company;

take a close look at more structural elements that will require a change in behaviour or organisation. This could mean indexing the variable compensation of sales reps, not to orders taken but to actual payments or margins made, reorganising production chains in order to reduce buffer stocks, shifting from a mass procedure to a process procedure,[5] introducing made-to-order production for slow-moving products, but also to optimise administrative procedures (paperless invoices, automated reminders) etc. Such changes are complex to put in place, and will require the active cooperation of a number of departments, which more often than not will mean the involvement of general management;

carry out an arbitrage between margins and working capital in order to buy or sell cash;

create a false appearance, by reducing working capital on the balance sheet using factoring, securitisation, discounting, reverse factoring etc. But let's not fool ourselves, working capital has not really been reduced, it has only been partly financed, and this part disappears from view in the same way that poverty is invisible in Potemkin villages. These are financing techniques that are discussed in Section 21.3.

Only the first two of the above ways of approaching working capital management will lead to the generation of cash without weighing heavily on the cost structure.

Working capital management is also a cultural issue. We saw in Section 11.3 that payment periods in Europe differ widely from one country to the next.

Some companies have a more developed cash culture than others, either because of the financial difficulties they have had to face in the past (carmakers in the 1980s), the influence of their shareholders (LBO funds make cash an essential lever of their culture[6]) or the approach of a manager (former financial director), which have made them sensitive to cash from a very early stage. Other firms have less of a cash culture because financial

conditions make cash less of a pressing problem or because their culture is far removed from such preoccupations (engineering firms, firms involved primarily in research and development, etc.).

In other words, if a cash culture is to take hold within a company, as an add-on to other cultures rather than a replacement, it will require a long learning period, patience, diplomacy and, above all, the support of general management, as it often leads to a root-and-branch overhaul of established practices with which staff are familiar and comfortable.

Finally, even though all employees can be expected to try to enhance their performance and improve their weak points, we can't help being a bit sceptical. Division managers are rarely superhuman. If we set division managers multiple targets of growing the market shares of their products, increasing margins, ensuring good relationships between labour and management and seeing to it that their divisions comply with corporate culture, not forgetting to innovate along the way, and then we also ask them to reduce their working capital over and above the obvious waste that needs to be avoided, we are perhaps asking too much of them. These multiple objectives could hamper managers in the performance of their tasks, with the risk that they are unable to perform properly and fail to achieve any of their goals.

We know of a multinational firm that has become a leader in its field as a result of innovation and highly effective marketing. Its margins are enviable and its after-tax return on capital employed is just under 20%, yet its working capital can hardly be described as good. Is it possible to be good at everything all of the time?

This rather existential question has, unfortunately, to give way to the more mundane. The following sections look at the operational and more concrete ways of reducing working capital. This may seem a bit dull, but it is the nuts and bolts of the field. Stay with us and be patient.

Section 49.2 MANAGING RECEIVABLES

Managing receivables involves:

negotiating better payment terms (general terms and conditions);

securing the actual payment of receivables as closely as possible to the original contractual terms and conditions;

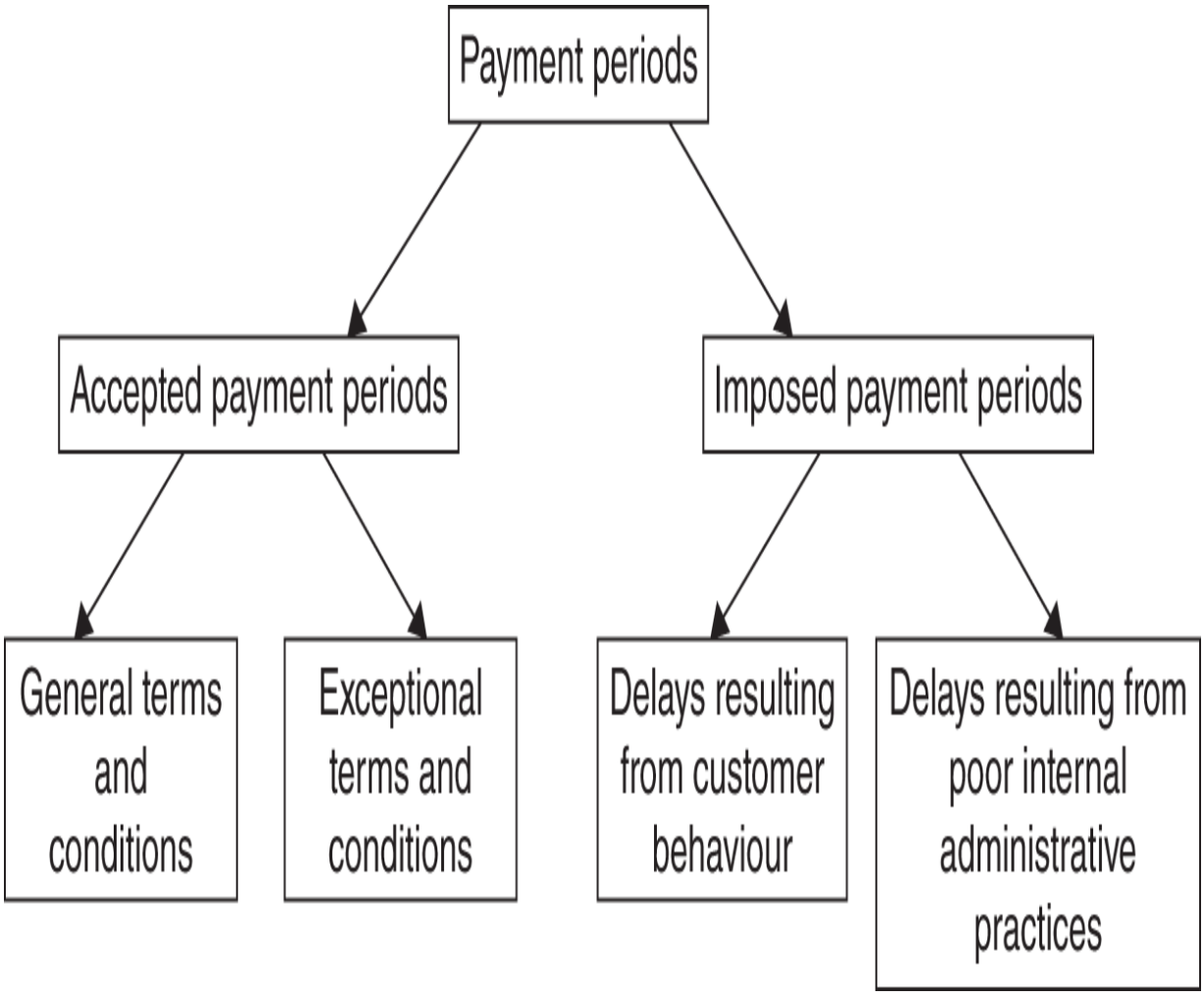
securing the payment of receivables in order to avoid bad debts.

The last two points are intertwined, as the risk of default increases in direct proportion to the length of the payment period. Payment periods for Spanish, Italian, Portuguese and Greek groups are twice as long as in Scandinavia, and, here, the default rate is twice as high.

1/ SPEEDING UP THE PAYMENT OF TRADE RECEIVABLES

Altares estimates that 45% of invoices remain unpaid on their due date and that 3.2% of them are still unpaid 90 days later.

Payment periods are often described as the result of four factors:



The general terms and conditions of sale make provision for payment periods that are set by the company and are in line with its strategy, standard industry practice and local customs.

When sales reps offer exceptional terms and conditions of payment, this means that the financial manager has made sure that they come with a commercial gain (higher price, larger volumes). If this is not the case, then sales reps will have to go back on their word, which is never easy with a customer who has been allowed to slide into bad habits! This is why it is best not to let sales reps make decisions on exceptional terms and conditions.

When customers fail to meet payment in full and on time, they are bending the rules and stretching the terms and conditions of sale which they signed up to. The EU Directive on the reduction of payment periods makes provisions for penalties for such infringements: late payment interest

calculated at the Central European Bank rate plus 10 points (10% in mid-2020). In certain countries, the law also makes provision for civil and criminal penalties (fines). Even though suppliers are under an obligation to apply them, they may think twice before doing so, given the potential negative consequences of such action.

In order to avoid ending up in this situation, it is in the company's best interests to:

contact customers 15 to 30 days before invoices are due in order to remind them that payment is due and to check that there are no problems with the invoice. If there are any problems, corrective measures should be taken immediately (for example, a new invoice with the correct purchase order number should be issued). Such reminders should preferably be made by telephone if they are to be more effective. They must be adapted to the type of customer (large companies vs. small businesses) and should target the largest outstanding amounts. Payment reminders also provide an opportunity to check that all invoices sent to a particular client are up to date;

identify customers that are systematically late payers or that regularly come up with stalling tactics in order to delay payment;

identify customers who have long and complicated internal invoice payment approval systems, for example a customer with multiple delivery sites for payments that are centralised and paid by batch (invoices approved for payment received after the 20th of the month are paid on the 10th of the following month, etc.);

set up a procedure for identifying swift and efficient dispute settlement. Customers that dispute invoices don't pay them. It is estimated that it takes, on average, 30 minutes to settle a dispute and that two-thirds of disputes are settled as soon as the first action is taken. Dispute settlement is all the more necessary since an unpaid invoice will often be an obstacle to new orders from the same customer, even if nothing is being done to understand and resolve the cause of the dispute;

send out written reminders at the latest 15 days after the invoice is due, followed by a second reminder 15 days after that, and a final reminder 15 days after the second reminder, before taking legal action or handing over the debt to a debt collection agency.

Delays resulting from the internal malfunctioning of the company are, in theory, the easiest to remedy, even though this often involves overhauling the company's administrative processes, while always keeping in mind the playoff between costs and efficiency. It's also a good idea to look at the time it takes for invoices to be issued because the payment period starts as of the date of the invoice, even if the product or service has already been provided. Checks should be carried out to ensure that the invoice bears the correct address and that the quantity invoiced is identical to the quantity ordered.

2/ SECURING THE PAYMENT OF TRADE RECEIVABLES

As a defaulting customer can cause a company to go bankrupt, it is in the company's best interests to protect its receivables from any risk in this regard.

There are several simple measures that can be put in place:

setting of a maximum credit limit for each major customer. In practice, two credit limits are often put in place, with the lower one triggering an alarm when it is breached, leading to an investigation into the customer's solvency. If the second credit limit is breached, then orders will no longer be taken from this customer, unless it agrees to pay on delivery or agrees to reservation of ownership clauses[7] for as long as it has not paid its commercial debt;

spot checks on the solvency of customers because a customer that is solvent today may not be solvent tomorrow. Such checks can be carried out by analysing the customer's accounts and checking its rating with professionals involved in commercial information (Ellisphere, Altares, Dun & Bradstreet, Creditsafe, etc.);

preparation of sales reps' prospecting campaigns by carrying out advance checks on the solvency of targets. This is good practice in order to avoid payment problems in the short term, but also from a long-term point of view as the most solvent companies often turn out to be the best customers with the best payment practices;

use of the most secure payment methods such as confirmed export letters of credit[8] or requirement of a down payment on ordering.

This is the province of the **credit manager**, generally attached to the finance department, who is responsible for trade receivables, customer risks and collection and is also required to optimise performance, working alongside the sales departments.

At a later stage, the credit manager may have to make use of the services of collection firms (Intrum, Ellisphere, Pouey, etc.), which handle the recovery of unpaid debts on behalf of companies, either amicably or through the courts.

In order to avoid such situations, the company can take out credit insurance. This is an insurance policy which guarantees the reimbursement of the unpaid debt by the credit insurer (Coface, Atradius, Euler Hermes, Zurich, SACE) in exchange for an insurance premium of between 0.10% and 2% of sales covered.[9] It is rare that full compensation is paid out as the company will still have to pay the insurance excess, which will be between 10% and 30% of the amount of the debt. The insurance payout is made either when the purchaser of the company's goods is declared insolvent or at the end of the waiting period before payment. In order to avoid carrying only the risks that the company knows are bad risks (adverse selection), insurance companies often insist on covering the whole of the company's customer portfolio.

Credit insurers provide three services:

the prevention of receivables risk through solvency analyses and the provision of centralised commercial information which they update on an ongoing basis;

recovery of unpaid invoices;

compensation on guaranteed debts it has not been possible to recover.

Credit managers also have other tools at their disposal to protect the company against defaulting customers:

bank guarantees: the banks of certain problem customers are sometimes prepared to provide a bank guarantee that they will meet their payments;

techniques used in trade finance such as the irrevocable and confirmed **documentary credit** (very popular in high-risk countries);

non-recourse factoring,[10] allowing a company to sell trade receivables.

Section 49.3 MANAGING TRADE PAYABLES

This item is often neglected as company buyers are often more keen to negotiate good prices than to negotiate advantageous payment periods.

But this is a pressing need with the development of credit insurance. If a company's supplier has taken out credit insurance to cover its receivables, and if the company pays after the contractual payment period and the supplier declares a default on payment to the insurance company, the company will be identified as a bad payer by the insurance company and this news will spread very quickly on the market.

Management of trade payables will mainly involve:

a review of payment periods negotiated with each supplier. The company will often discover that it has a wide range of payment periods as a result of decentralisation. Even at companies where purchasing negotiations are centralised, payment periods are not dealt with as the focus is often only on prices fixed for the whole of the group. In such cases, the company should negotiate with its biggest suppliers and try to align all payment periods with the longest periods that are already in place. The company can try and force smaller suppliers to accept such longer payment periods;

a comparison of theory (contractual payment periods) and practice (the actual period after which the company pays) will highlight situations in which the company pays earlier than it should. Often, if lack of discipline and incompetence are eliminated as causes, the reason for this is that different dates appear in the terms of payment in the contract, on the order and even on the invoice. Sometimes companies pay on the 15th of the month amounts that are due between the 15th and the 30th, and on the 30th of the month amounts that are due between the 1st and the 15th of the following month. There are other times when the supplier delivers the goods or service earlier than planned, and sends off the invoice immediately;

a review of the procedure for validating the receipt of deliveries will help to prevent late validation of deliveries which, in the best of cases, generates delays in invoice accounting and hence payment delays, which could result in heavy penalties. In the worst of cases, new orders will be triggered as the stocks in the system could appear to be abnormally low!;

finally, disputes should be dealt with quickly as they will not result in any extension of the contractual payment period.

Suppliers should not be paid late or in advance (except to get a discount), they should be paid on time.

Section 49.4 INVENTORY MANAGEMENT

The ability of a company to manage its inventories well is dependent on several parameters and on how well the company manages these:

its ability to correctly forecast the level of activity in advance, which is highly dependent on the sector;

its ability to carry out cross-analyses between product families and customer families in order to be able to work out suitable supplies and storage policies;

its ability to reduce its supply periods;

its ability to transform its stocks rapidly from raw materials into finished products, and then to sell them (called optimisation of the production process);

its ability to monitor stock levels;

its ability to obtain a service rate[11] high enough to avoid stockouts.

Experience has shown that when a company takes a serious look at its inventory levels, it can achieve impressive results. We know of a company that has been able to reduce its inventories by 23%, cutting them from 70 to 54 days of sales. Progress in logistics and IT management have played a large role in these improvements. However, it would be fallacious to believe that it is always best to keep inventories low. Inventories remain an investment which results from a playoff of financial cost versus the flexibility gained.

As for the management of receivables, managing inventories involves action to combat waste and more structural action.

Action to combat waste includes:

selling off dormant inventories for which orders have not been placed for more than a year;

systematically using the **Wilson formula** for determining the optimal quantity to order. The Wilson formula[12] consists in playing off the cost of placing the order (administrative cost, discount in line with size of order) against the cost of storage (financial cost of tying up capital, storage and risk);

reducing uncertainty over supplies by analysing delivery periods and the reliability of the various suppliers or even setting up partnerships with some suppliers (as is the case in the automotive industry);

integrating sales forecasts into the stock management tool;

determining the inventories policy on the basis of service rates to be provided to customers.

Structural measures include:

shifting from a mass production mode to a process mode,[13] which is not without cost as the firm will lose flexibility and run the risk of breaks in production; or shifting from a workshop production mode to a mass production mode;

shifting from a mass production mode to made-to-order unit production. This will mean sacrificing economies of scale but with technological development (e.g. 3D printing), production costs may still be reasonable and a build-up of unsold stock or lost sales can be avoided;

including performance-based targets in the calculation of the variable remuneration of stock managers (only 20% of groups have such systems in place);

optimising the location of stock and of picking processes at factories, in order to reduce in-transit inventory;

working on sales forecasts so as to reduce buffer stocks and anticipation inventories, which may involve working more closely with the firm's main customers or working out precise statistics in order to be in a better position to determine the seasonality or the cyclical nature of sales;

simplifying the range of products offered by reducing varieties which increase the number of unit stocks.

Section 49.5 CONCLUSION

Financial managers will not be able to put in place measures for managing working capital without the close collaboration of operational managers responsible for purchasing, stocks, logistics, production, sales and human resources, over whom financial managers have no authority. Over and above the fight against waste, managing working capital often quickly leads to strategic decisions involving the firm's commercial, production and logistics policies.

Financial managers will, this time internally, have an opportunity to demonstrate their teaching skills and negotiating talents.

SUMMARY

The summary of this chapter can be downloaded from www.vernimmen.com.

Working capital is an investment, like any other, and accordingly it has to be managed. Management of working capital does not necessarily mean reducing it at all costs. Working capital is the result of a playoff between liquidity and margins.

Over and above waste, which is relatively simple to eliminate but which requires determination and an ongoing effort, working capital can only be reduced at the expense of EBIT or at the cost of investing in modifying the firm's economic model.

In crisis periods, the firm will focus on reducing working capital in order to generate cash, which is useful for paying down debt or self-financing projects. The impact on margins is less of an issue. During economically good times, the firm will focus more on sales and margins than on working capital.

All of the techniques and tools for managing working capital are described in this chapter.

Financial managers will not be able to put in place measures for managing working capital without the close collaboration of operational managers responsible for purchasing, stocks, logistics, production, sales and human resources, over whom financial managers have no authority. Over and above the fight against waste, managing working capital often quickly leads to strategic decisions involving the firm's commercial, production and logistics policies.

Financial managers will, this time internally, have an opportunity to demonstrate their teaching skills and negotiating talents.

QUESTIONS

1/For how long can factories be shut down while surplus stocks are absorbed?

2/Why does managing working capital involve both supply management and strategy?

3/Why do LBO funds set so much store on the management of working capital?

4/In what conditions is excessive working capital not the sign of poor management?

5/A customer suddenly increases their orders from you. What is your reaction?

6/You are late in paying an invoice. You have not received a reminder. What do you conclude?

7/What are the three documents that prove the existence of a debt and which are indispensable for sending out an effective reminder?

8/Is the securitisation of trade receivables or inventories a way of managing working capital?

9/What are the services provided by credit insurance?

10/Why would a company, knowing that its suppliers had taken out credit insurance for part of the trade payables it owes, be well advised to pay by the due date?

11/A client has the choice of paying at 10 days with a 2% discount or at 60 days, and it chooses the latter option. What does this signal?

12/Why is there a correlation between payment period and rate of customer default?

13/Is managing working capital only the business of the financial manager? Why?

14/What could a group be tempted to do if it fears that at the close of its financial year it will be unable to meet its debt covenants, resulting in the restructuring or possibly even the calling-in of this debt?

You'll find more questions at www.vernimmen.com.

EXERCISES

1/Provide a simple example to illustrate that upstream integration increases working capital.

2/Provide a simple example to illustrate that downstream integration increases working capital.

3/Show how the figure 44.6% (mentioned on page 893) is calculated.

4/A company makes annual sales of €10m (excl. VAT) and is subject to VAT at a rate of 20%. Its actual collection time is 75 days. What is the average outstanding amount receivable? The payment period has to be reduced to 60 days for legal reasons. How much extra cash will this mean for the company? What is the impact on the income statement if the company is currently borrowing at 4%?

5/A company posts monthly sales of €100,000 with a customer for which its gross margin is 25%. How long after the start of the relationship with this customer can the customer go bankrupt without the company making any net losses, given the gross margin made and the total loss of trade payables that remain unpaid? The payment period is two months.

ANSWERS

Questions

1/*Some factories take a long time to shut down or start up again. It takes a lot longer to start up a blast furnace than it does to start up a sewing machine!*

2/*It involves strategy, because it depends on the commercial, production and financial strategy of the firm – arbitrage, margin and volume vs. cash. It involves supply management, as this is the continuation of small actions and decisions to be implemented.*

3/*Because by tightening up its working capital, the firm generates cash which will enable it to reimburse part of its debt and improve the IRR of the LBO fund.*

4/*If this situation is desired and the result of a conscious decision, and not something the company has to reluctantly bear. If, in exchange, the company receives more orders and records higher margins.*

5/*Has this customer failed to pay a competitor, which is now refusing to make more deliveries? This may be why the customer has increased orders from you.*

6/*Your supplier is badly organised and/or rich!*

7/*The order slip and the delivery slip signed by the customer, the invoice.*

8/*No, merely a way of financing working capital.*

9/*The analysis of the solvency of customers/prospects, the recovery of bad debts, compensation for receivables that are not recovered.*

10/*Because the market will find out very quickly if the firm is a bad payer via the credit insurer, which will pass on this information to its other clients.*

11/*Either that it has no cash or that its marginal cost of debt is higher than 15.6%, which is not a good sign of its future prospects!* $15.6\% = (1 + 2\%)^{365/50} - 1$.

12/*Because a customer who pays late does not necessarily do so on purpose, but also does so because of liquidity problems, which indicates a high risk of bankruptcy.*

13/*No, because it also involves the commercial, marketing, production/logistics managers, and even the general manager, who have to make choices and decisions, playing various factors off against others.*

14/*It can buy cash by temporarily reducing its working capital in order to reduce its net debt.*

Exercises

A detailed Excel version of the solutions is available at www.vernimmen.com.

1/A factory pays all of its suppliers 900 on day 1, and receives 980 from its retailer customer on day 60. The retailer pays its supplier (the factory) 980 and 100 to other suppliers on day 60, and receives 1,100 from its customers on day 90.

For 60 days, the factory has a cash deficit of 900, which is its working capital, and makes a margin of 80. For 30 days, the retailer has a cash deficit of 1080, which is its working capital, and makes a margin of 1,100 − 980 − 100 = 20.

If the factory buys the retailer, it carries working capital of 900 over 90 days and of 100 over 30 days, or an average of 933 over 90 days compared with 900 over 60 days.

Its working capital has thus increased.

2/Let's take the above example again. This time, let's say that the retailer buys the factory. It carries 1,080 over 30 days. Now it has to carry 900 over 90 days and 100 over 30 days, or an average of 933 over 90 days. Its working capital has thus increased.

3/ $98 = 100/(1 + r)^{20/365}$ *so r = 44.6%.*

4/€10 × 1.2 × 75 / 365 = €2.5m. Cash gain: 2.5 − €10 × 1.2 × 60 / 365 = €0.5m. Savings in terms of financial expense: €0.5m × 4% = €20,000.

5/Monthly margin: 100,000 × 25% = €25,000. Company's financial risk: 100,000 × (1 − 25%) × 3 months = €225,000. 225 / 25 = 9 months of margins collected. Period of 9 + 3 months of margins not collected = 1 year. A 2-month payment period means 3 months of invoices, as customers generally go bankrupt just before a payment is due and not just after they have paid.

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NOTES

1 *And ours when we see that the Vernimmen is only available for delivery in 10 days on Amazon!*

2 *See Section 35.1, 3/.*

3 *See Section 35.1, 3/.*

4 *Without taking into account the fact that purchases are made by whole container or that more is bought in order to avoid stock outs (more than one month's delay).*

5 *Which often means rebalancing part of the company's stocks, like the carmakers did in the 1980s. See Section 8.2, 2/.*

6 *See Chapter 47.*

7 *Enabling the company that has not yet been paid to automatically recover its asset if the customer goes bankrupt, without having to join the queue of creditors.*

8 *See Section 21.3.*

9 *Excluding very risky export regions and excluding very long periods for major export works.*

10 *See Section 21.3.*

11 *Calculated as the number of error-free orders delivered on time/number of orders.*

12 *Which you can download from www.vernimmen.com.*

13 *See Section 8.2.*

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Chapter 50
CASH MANAGEMENT

A balancing act …

Cash management is the traditional role of the treasury function. It handles cash inflows and outflows, as well as intra-group fund transfers. With the development of information systems, this function is usually largely automated. As a result, the treasurer merely designs or chooses a model, and then supervises the day-to-day operations. Nonetheless, we need to take a closer look at the basic mechanics of the treasury function to understand the relevance and impact of the different options.

Section 50.1 THE BASICS

1/ VALUE DATING

From the treasurer's standpoint, the balance of cash flows is not the same as that recorded in the company's accounts or that shown on a bank statement. An example can illustrate these differences.

Example: A, a company headquartered in Amsterdam, issues a cheque for €1,000 on 15 April to its supplier R in Rotterdam. Three different people will record the same amount, but not necessarily on the same date:

A's **accountant**, for whom the issue of the cheque theoretically makes the sum of €1,000 unavailable as soon as the cheque has been issued;

A's **banker**, who records the €1,000 cheque when it is presented for payment by R's bank. He then debits the amount from company A's account based on this date;

A's **treasurer**, for whom the €1,000 remains available until the cheque has been debited from the relevant bank account. The date of debit depends on when the cheque is cashed in by the supplier and how long the payment process takes.

There may be a difference of a few days between these three dates, which determines movements in the three separate balances.

Cash management based on value dates, in countries where this system is used,[1] is built on an analysis from the treasurer's standpoint. The company is interested only in the periods during which funds are actually available. Positive balances can then be invested or used, while negative balances generate real interest expense.

The date from which a bank makes incoming funds available to its customers does not always correspond exactly to the payment date. As a result, a **value date** can be defined as follows:

for an interest-bearing account, it represents the date from which an amount credited to the account bears interest following a collection of funds; and the date from which an amount debited from the account stops bearing interest following a disbursement of funds;

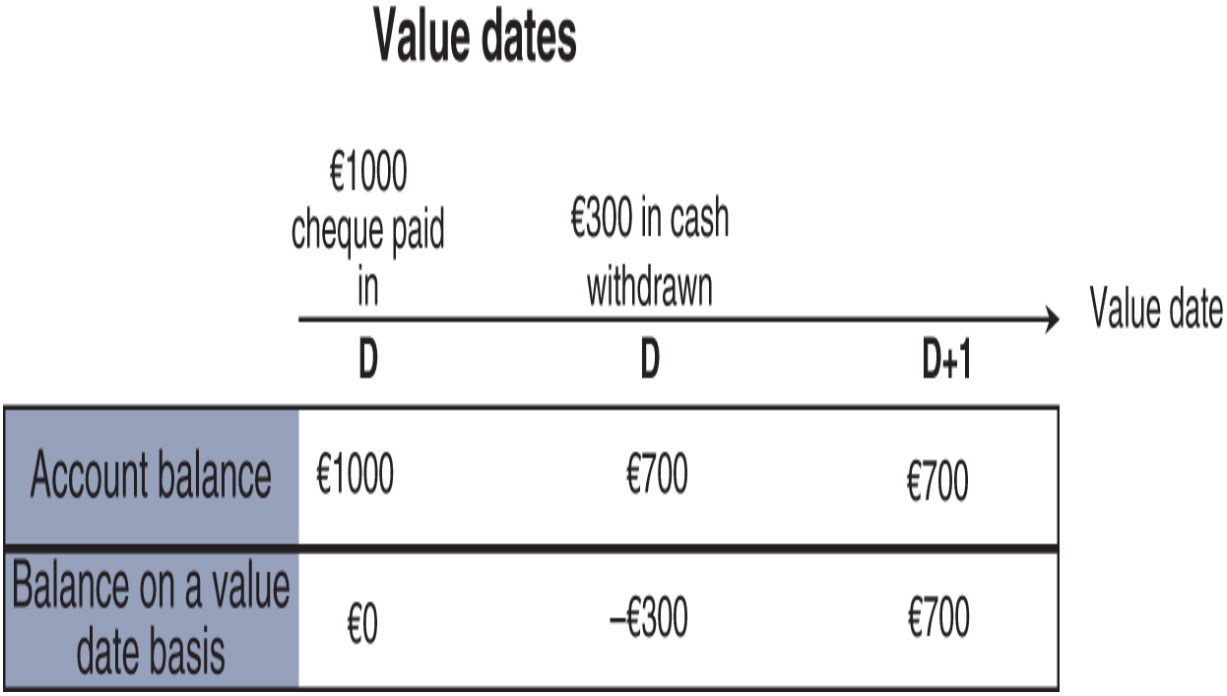
for a demand deposit account,[2] it represents the date from which an amount credited to the account may be withdrawn without the account holder having to pay overdraft interest charges (in the event that the withdrawal would make the account show a debit balance) following a collection; and the date from which an amount debited from the account becomes unavailable following a disbursement.

Under this system, it is therefore obvious that:

a credit amount is given a value date after the credit date for accounting purposes;

a debit amount is given a value date prior to the debit date for accounting purposes.

Let us consider, for example, the deposit of the €1,000 cheque received by R when the sum is paid into an account. We will assume that the cash in process is assigned a value date one banking day later, and that on the same day R makes a withdrawal of €300 in cash, with a similar value date.



Account balance	€1000	€700	€700
Balance on a value date basis	€0	–€300	€700

Although the initial account balance is zero, R's account is in debit on a value date basis and in credit from an accounting standpoint.

Although the account balance always remains in credit from an accounting standpoint, the balance from a value date standpoint shows a debit of €300 until D + 1. The company will therefore incur interest expense, even though its financial statements show a credit balance.

In the European Economic Area, the value date is a maximum of one working day after the transaction has been processed. Companies generally negotiate for transactions to be credited or debited on the day on which they are executed. The transaction may, however, be executed the following day if it is transmitted too late in the afternoon (after the cut-off time set by the bank).

The increasingly limited use of cheques and the widespread use of systems that allow for immediate accounting of cashflows (SEPA, real-time payment, etc.) are making value dates increasingly obsolete. Moreover, negative interest rates do not encourage banks to anticipate the arrival of funds in their books as they would have to transfer the funds to the central bank with a negative return.

2/ ACCOUNT BALANCING

Company bank current accounts are intended simply to cover day-to-day cash management. They offer borrowing and investment conditions that are far from satisfactory:

the cost of an overdraft where the conditions have not been pre-negotiated is much higher than that of any other type of borrowing;

the interest rate paid on credit balances is low or zero. But today it is not so bad when money market funds offer a negative return and banks charge negative interest rates on too large balances.

It is therefore easy to understand why it makes little sense for the company to run a permanent credit or debit balance on a bank account. **A company generally has several accounts with various different banks.** An international group may have several hundred accounts in numerous different currencies, although the current trend is towards a reduction in the number of accounts operated by businesses (notably to reduce operational risks).

One of the treasurer's primary tasks is to avoid financial expense (or reduced financial income) deriving from the fact that some accounts are in credit while others show a debit balance. The practice of **account balancing** is based on the following two principles:

avoiding the simultaneous existence of debit and credit balances by transferring funds from accounts in credit to those in debit;

channelling cash outflows and cash inflows so as to arrive at a balanced overall cash position.

> In the account balancing process, cash surpluses are pooled daily into a concentration account through interbank transfers and are used to finance accounts in debit.

Banks offer account balancing services, whereby they automatically make the requisite transfers to optimise the balance of company accounts.

3/ BANK CHARGES

The return on equity[3] generated by a bank from a customer needs to be analysed by considering all the services, loans and other products the bank offers, including some:

not charged for and thus representing unprofitable activities for the bank (e.g. cheques deposited by retail customers in some countries);

charged for over and above their actual cost, notably using charging systems that do not reflect the nature of the transaction processed.

Banks now tend to invoice companies the actual price of the financial flow management services provided, through ad hoc charges. This activity is no longer seen as one of the ways of compensating for an undervalued price of loans as part of an overall relationship (the side business in Section 39.1). Banks currently see managing the financial flows of companies as a strategic activity, enabling them to better understand their clients' risks on the basis of their financial flows and to improve their own liquidity (Basel III ratios). It should be noted that fees charged by banks are not always transparent, and companies are lobbying for the standardisation of fees

through electronic reporting, similar to the Bank Service Billing system in the USA.

Section 50.2 CASH MANAGEMENT

1/ CASH BUDGETING

The cash budget shows not only the cash flows that have already taken place, but also all the receipts and disbursements that the company plans to make. These cash inflows and outflows may be related to the company's investment, operating or financing cycles.

The cash budget, showing the amount and duration of expected cash surpluses and deficits, serves two purposes:

to ensure that the credit lines in place are sufficient to cover any funding requirements;

to define the likely uses of loans by major categories (e.g. the need to discount based on the company's trade debts).

Planning cash requirements and resources is a way of adapting borrowing and investment facilities to actual needs and, first and foremost, of managing a company's interest expense. It is easy to see that a better loan rate can be negotiated if the need is forecast several months before the need arises. Likewise, a treasury investment will be more profitable over a predetermined period, during which the company can commit not to use the funds.

The cash budget is a **forward-looking management chart showing supply and demand for liquidity within the company**. It allows the treasurer to manage interest expense as efficiently as possible by harnessing competition not only among different banks, but also with investors on the financial markets.

2/ FORECASTING HORIZONS

Different budgets cover different forecasting horizons for the company. Budgets can be used to distinguish between the degree of accuracy users are entitled to expect from the treasurer's projections.

Companies forecast cash flows by major categories over long-term periods and refine their projections as cash flows draw closer in time. Thanks to the various services offered by banks, budgets do not need to be 100% accurate,

but can focus on achieving the relevant degree of precision for the period they cover.

An annual cash budget is generally drawn up at the start of the year based on the expected profit and loss account, which has to be translated into cash flows. The top priority at this point is for cash flow figures to be consistent and material in relation to the company's business activities. At this stage, cash flows are classified by category rather than by type of payment.

These projections are then refined over periods ranging from one to six months to yield rolling cash budgets, usually for monthly periods. These documents are used to update the annual budgets based on the real level of cash inflows and outflows, rather than using expected profit and loss accounts.

Day-to-day forecasting represents the final stage in the process. This is the basic task of all treasurers and the basis on which their effectiveness is assessed. Because of the precision required, day-to-day forecasting gives rise to complex problems:

it covers all the movements affecting the company's cash position;

each bank account needs to be analysed;

it is carried out on a value date basis;

it exploits the differences between the payment methods used;

as far as possible, it distinguishes between cash flows on a category-by-category basis.

The following table summarises these various aspects:

	BANK No. 1 Account value dates				
	Monday	**Tuesday**	**Wednesday**	**Thursday**	**Friday**

	BANK No. 1 Account value dates				
	Monday	**Tuesday**	**Wednesday**	**Thursday**	**Friday**
Bills presented for payment Cheques issued Transfers issued Standing orders paid Cash withdrawals Overdraft interest charges paid Sundry transactions **(1) TOTAL DISBURSEMENTS**					
Customer bills presented for collection Cheques paid in Standing orders received Transfers received Interest on treasury placements Sundry transactions **(2) TOTAL RECEIPTS** **(2) – (1) = DAILY BALANCE ON A VALUE DATE BASIS**					

Day-to-day forecasting has been made much easier by IT systems. Thanks to the ERP[4] and other IT systems used by most companies, the information received by the various parts of the business is processed directly and can be used to forecast future disbursements instantaneously. As a result, cash

budgeting is linked to the availability of **information** and thus of the characteristics of the **payment methods** used.

3/ THE IMPACT OF PAYMENT METHODS

The various payment methods available raise complex problems and may give rise to uncertainties that are inherent in day-to-day cash forecasting. There are two main types of uncertainty:

Is the forecast timing of receipts correct? A cheque may have been collected by a sales agent without having immediately been paid into the relevant account. It may not be possible to forecast exactly when a client will pay down its debt by bank transfer.

When will expenditure give rise to actual cash disbursements? It is impossible to say exactly when the creditor will collect the payment that has been handed over (e.g. cheque, or even a bill of exchange or promissory note when they are still used, as they have become quite rare).

From a cash budgeting standpoint, payment methods are more attractive where one of the two participants in the transaction possesses the initiative both in terms of **setting up the payment** and **triggering the transfer of funds**. Where a company has this initiative, it has **much greater certainty** regarding the value dates for the transfer.

The following table shows an analysis of the various payment methods used by companies from this standpoint. It does not take into account the risk of non-payment by a debtor (e.g. not enough funds in the account, insufficient account details, refusal to pay). This risk is self-evident and applies to all payment methods.

	Initiative for setting up transfer	**Initiative for completing fund transfer**	**Utility for cash budgeting**
Transfer[5]	Debtor	Debtor	Debtor
Debit[6]	Creditor	Creditor	Creditor
Cheque	Debtor	Creditor	None

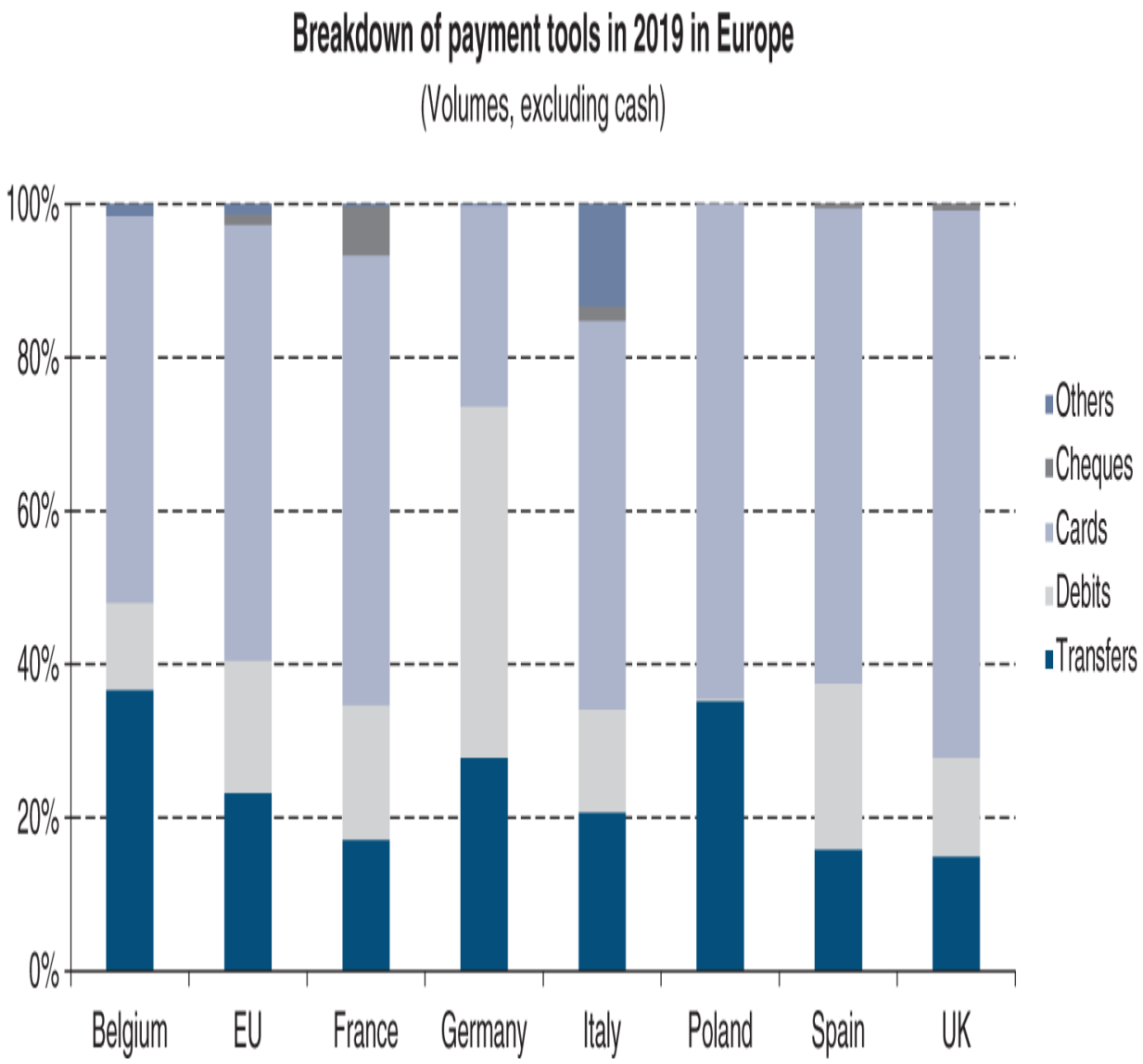
	Initiative for setting up transfer	Initiative for completing fund transfer	Utility for cash budgeting
Electronic promissory note[7]	Debtor	Creditor	

From this standpoint, establishing the actual date on which cheques will be paid represents the major problem facing treasurers.

Although their due date is generally known, domiciled bills[8] and notes can also cause problems. If the creditor is slow to collect the relevant amounts, the debtor, which sets aside sufficient funds in its account to cover payment on the relevant date, is obliged to freeze the funds in an account that does not pay any interest. It is in the interests of the debtor company to work out a statistical rule for the collection of domiciled bills and notes and to get to know the collection habits of its main suppliers.

> The treasurer's experience is invaluable, especially when it comes to forecasting the behaviour of customers (payment dates) and of creditors (collection dates for the payment methods issued).

Aside from the problems caused by forecasting uncertainties, payment methods do not all have the same flexibility in terms of domiciliation, i.e. the choice of account to credit or debit. The customer cheques received by a company may be paid into an account chosen by the treasurer. The same does not apply to standing orders and transfers, where the account details must usually be agreed in advance and for a certain period of time. This lack of flexibility makes it harder to balance accounts. Lastly, the various payment methods have different value dates. The treasurer needs to take the different value dates into account very carefully in order to manage the account balances on a value date basis.



Each country has its own history and payment habits in Europe; these are far from being unified.

Source: Data from European Central Bank, 2020

Harmonisation of payment methods in the eurozone (Single Euro Payment Area, or SEPA) has allowed companies or individuals to transfer money and debits as easily and as quickly and at the same cost as if the transfer were between two towns in the same country.

New payment methods that take advantage of the SEPA standard have been developed, such as SEPAmail, the main service of which is an email transfer for paying invoices at radically reduced processing costs, much faster processing periods and reduced risks of fraud. This is what

Blockchain will be able to do on a very large scale, once it is developed beyond the experimental phase it is in today.

4/ OPTIMISING CASH MANAGEMENT

Our survey of account balancing naturally leads us to the concept of **zero cash**, the nirvana of corporate treasurers, which keeps interest expense down to a minimum (even though in the current climate of very low, even negative, short-term interest rates, this is becoming a worry of the past).

Even so, this aim can never be completely achieved. A treasurer always has to deal with some unpredictable movements, be they disbursements or collections. The greater the number or volume of unpredictable movements, the more imprecise cash budgeting will be and the harder it is to optimise. That said, several techniques may be used to improve cash management significantly.

(a) Behavioural analysis

The same type of analysis as performed for payment methods can also yield direct benefits for cash management. The company establishes collection times based on the habits of its suppliers. A statistical average for collection times is then calculated. Any deviations from the normal pattern are usually offset where an account sees a large number of transactions. **This enables the company to manage the cash balance on each account to "cover" payments forecast with a certain delay** of up to four or five days **for value date purposes**.

> Optimising forecasts using behavioural studies directly leads to the optimisation of cash flow management.

In any case, payments will always be covered by the overdraft facilities agreed with the bank, the only risk for the company being that it will run an overdraft for some limited period and thus pay interest expense.

(b) Intercompany agreements

Since efficient treasury management can unlock tangible savings, it is normal for companies that have commercial relationships to get together to

maximise these gains. Various types of contract have been developed to facilitate and increase the reliability of payments between companies. Some companies have attempted to demonstrate to their customers the mutual benefits of harmonisation of their cash management procedures and negotiated special agreements. In a bid to minimise interest expense attributable to the use of short-term borrowings, others offer discounts to their customers for swift payment. Nonetheless, this approach has drawbacks because, for obvious commercial reasons, it is hard to apply the stipulated penalties when contracts are not respected.

(c) Lockbox systems

Under the lockbox system, the creditor asks its debtors to send their payments directly to a PO box that is emptied regularly by its creditor bank. The funds are immediately paid into the banking system, without first being processed by the creditor's accounting department.

When the creditor's and debtor's banks are located in the same place, cheques can easily be cleared on the spot. Such clearing represents another substantial time saving. This system, which is still widely used, particularly in the United States, will certainly disappear with the rapid decline in payments by cheque.

(d) Checking bank terms

The complexity of bank charges and the various different items on which they are based makes them hard to check. This task is thus an integral part of a treasurer's job.

Companies implement systematic procedures to verify all the aspects of bank charges. The conditions used to calculate interest payments and transaction charges may be verified by reconciling the documents issued by the bank (particularly interest-rate scales and overdraft interest charges) with internal cash monitoring systems. Flat-rate charges may be checked on a test basis, which is more than necessary as banks' back office teams are generally far from perfect.

Section 50.3 CASH MANAGEMENT WITHIN A GROUP

Managing the cash position of a group adds an additional layer of data-processing and decision-making based on principles that are exactly the same as those explained in Sections 50.1 and 50.2 for individual companies (i.e. group subsidiaries or SMEs[9]).

1/ CENTRALISED CASH MANAGEMENT

The methods explained in the previous sections show the scale of the task facing a treasury department. It therefore seems natural to centralise cash management on a group-wide basis, a technique known as cash pooling, since it allows a group to take responsibility for all the liquidity requirements of its subsidiaries.

The cash positions of the subsidiaries (lenders or borrowers) can thus be pooled in the same way as the various accounts of a single company, thereby creating a genuine internal money market. The group will thus save on all the additional costs deriving from the inefficiencies of the financial markets (bank charges, brokerage fees, differences between lending and borrowing rates, etc.). In particular, cash pooling enables a group to hold on to the borrowing/lending margin that banks are normally able to charge.

> Cash pooling balances the accounts of a group's subsidiaries, thereby saving on the interest expense.

This is not the only benefit of pooling. It gives a relatively big group comprising a large number of small companies the option of tapping financial markets. Information-related costs and brokerage fees on an organised market may prevent a large number of subsidiaries from receiving the same financing or investment conditions as the group as a whole. With the introduction of cash pooling, the corporate treasurer can address the financing needs of the entire group by going to market. The treasurer then organises an internal refinancing of each subsidiary on the same financing terms that the group receives.

Cash pooling has numerous advantages. The manager's workload is not proportional to the number of transactions or the size of the funds under management. Consequently, there is no need to double the size of a department handling the cash needs of twice the number of companies. The skills of existing teams will nevertheless need to be enhanced. Likewise, investment in systems (hardware, software, communication systems, etc.) can be reduced when they are pooled within a single central department. Information-gathering costs can yield the same type of saving. Consequently, cash pooling offers scope for genuine “industrial” economies of scale.

Although the creation of a cash pooling unit may be justified for very good reasons, it may also lead to an unwise financial strategy and possibly even management errors. Notably, cash pooling will give rise to an internal debt market totally disconnected from the assets being financed. Certain corporate financiers may still be heard to claim that they have secured better financing or investment terms by leveraging the group's size or the size of the funds under management.

Let's not confuse two situations which are different. On the one hand, we have integration within a much larger set of smaller companies in the same sector, which immediately enjoy better financial terms that the group has access to thanks to its size and strong negotiating position. On the other hand, the integration of higher-risk entities, which, if they are able to get better financial terms, owe this either to the short-sightedness of lenders and rating agencies (which won't last) or to the detriment of the cost of financing of the whole (which will rise). We should not forget that in a market economy, only the level of risk of each investment determines its cost of financing. Any other line of reasoning is not tenable over the long term.

> In theory, once a company has achieved the critical mass needed to give it access to the financial markets, any economies of scale generated by cash pooling are “industrial” rather than financial.

A prerequisite for cash pooling is the existence of an efficient system transmitting information between the parent company and its subsidiaries. The system requires the subsidiaries to send their forecasts to the head

office in real time. The rapidity of fund movements – i.e. the unit's efficiency – depends on the quality of these forecasts, as well as on that of the corporate information system.

Lastly, a high degree of centralisation can reduce the risks of fraud but also reduces the subsidiaries' ability to take initiatives. The limited responsibilities granted to local cash managers may encourage them not to optimise their own management when it comes to either conducting behavioural analysis of payments or controlling internal parameters. Local borrowing opportunities at competitive rates may therefore go begging. To avoid demotivating the subsidiaries' treasurers, they may be given greater responsibility for local cash management.

2/ THE DIFFERENT TYPES AND DEGREES OF CENTRALISATION

There are many different ways of pooling a group's cash resources in practice, ranging from the outright elimination of the subsidiaries' cash management departments to highly decentralised management. There are two major types of organisation, which reflect two opposite approaches:

Most common is the centralisation of balances and liquidity, which involves the group-wide pooling of cash from the subsidiaries' bank accounts. The group balances the accounts of its subsidiaries just as the subsidiaries balance their bank accounts. There are a number of different variations on this system.

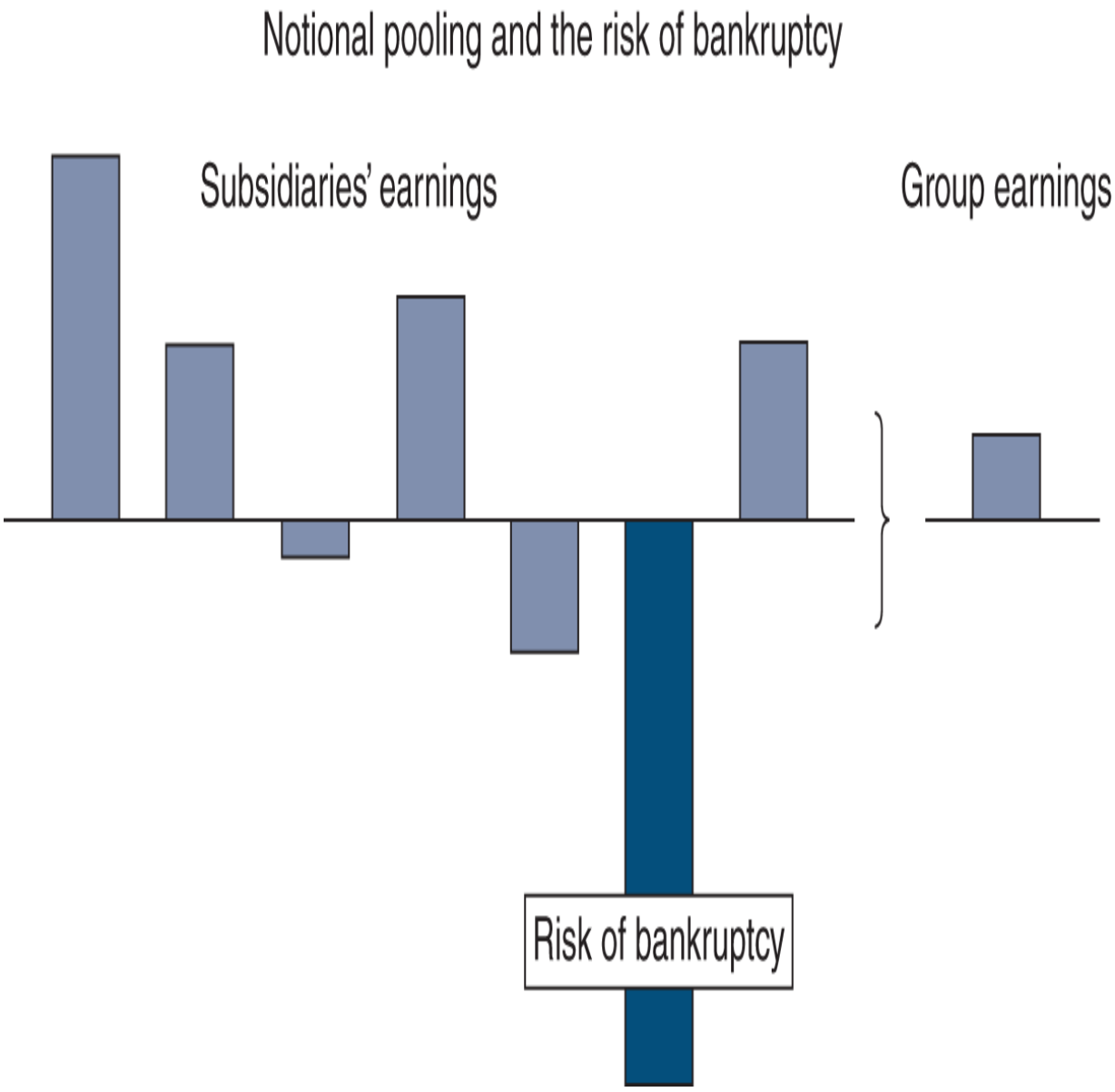
The centralisation of cash balances can be dictated from above or carried out upon request of the subsidiary. In the latter case, each subsidiary decides to use the group's cash or external resources in line with the rates charged, thereby creating competition between the banks, the market and internal funds. This flexibility can help alleviate any demotivation caused by the centralisation of cash management.

Significantly rarer is the centralisation of cash flows, under which the group's cash management department not only receives all incoming payments, but may also even make all the disbursements. The department deals with issues such as due dates for customer payments and customer payment risks, reducing the role of any subsidiary to providing information and forecasting. This type of organisation may be described as hypercentralised.

Coherent cash management requires the definition of uniform banking terms and conditions within a group.

Notional pooling provides a relatively flexible way of exploiting the benefits of cash pooling. With notional pooling, subsidiaries' account balances are never actually balanced, but the group's bank recalculates credit or debit interest based on the fictitious balance of the overall entity. This method yields exactly the same result as if the accounts had been perfectly balanced, **but the fund transfers are never carried out in practice**. As a result, this method leaves subsidiaries some room for manoeuvre and does not impact on their independence.

A high-risk subsidiary thus receives financing on exactly the same terms as the group as a whole, while the group can benefit from limited liability from a legal standpoint by declaring its subsidiary bankrupt. Banks thus introduce additional restrictions and request reciprocal guarantees between each of the companies participating in the pooling arrangements. This often takes the form of a formal guarantee given by the parent company (parent company guarantee, PCG).



Consequently, cash balances are more commonly pooled by means of the daily balancing of the subsidiaries' positions. The **zero balance account (ZBA)** concept requires subsidiaries to balance their position (i.e. the balance of their bank accounts) each day by using the concentration accounts managed at group or subgroup level. The banks offer automated balancing systems and can perform all these tasks on behalf of companies. The use of ZBA requires a set of legal agreements between the parent company and each subsidiary (cash management agreements), which must be negotiated at arm's length so as not to raise any legal or tax issues.

In summary, the degree of centralisation of cash management and the method used by a group do not depend on financial criteria only. The three key factors are as follows:

the group's managerial culture, e.g. notional pooling, is more suited to highly decentralised organisations than daily position balancing;

regulations and tax systems in the relevant countries;

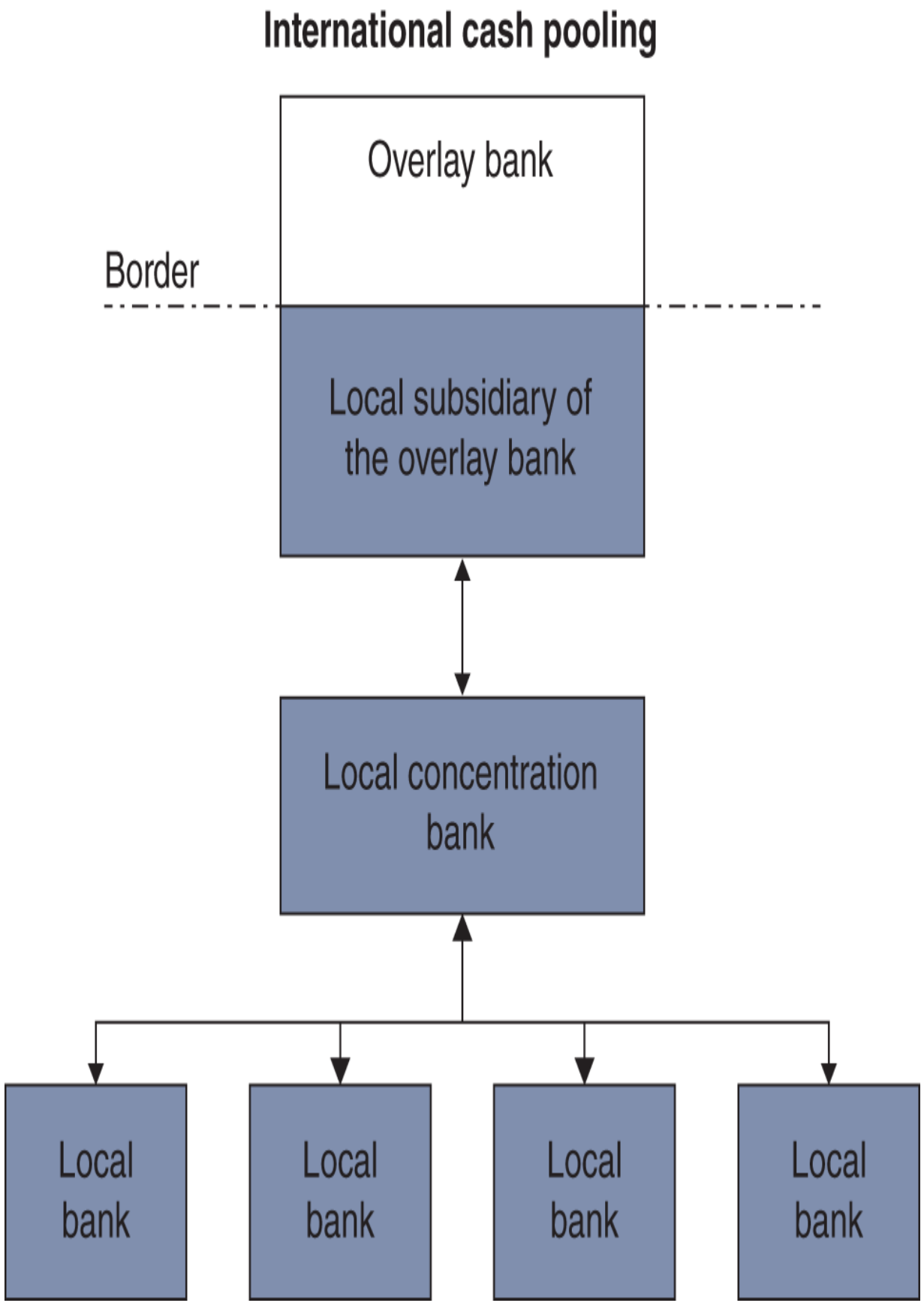
the cost of banking services. While position balancing is carried out by the group, notional pooling is the task of the bank.

It should be stressed that the first step, certainly the most important (and least costly) of cash pooling, is the centralisation of information on the cash position within the group. Sometimes centralisation can stop there!

3/ INTERNATIONAL CASH MANAGEMENT

The problems arising with cash pooling are particularly acute in an international environment. That said, international cash management techniques are exactly the same as those used at national level, i.e. pooling on demand, notional pooling, account balancing.

Regulatory differences make the direct pooling of account balances of foreign subsidiaries a tricky task. Indeed, many groups find that they cannot do without the services of local banks, which are able to collect payments throughout a given zone. Consequently, multinational groups tend to apply a two-tier pooling system. A local concentration bank performs the initial pooling process within each country, and an international banking group, called an overlay bank, then handles the international pooling process.


International cash pooling
Overlay bank
Border
Local subsidiary of the overlay bank
Local concentration bank
Local bank
Local bank
Local bank
Local bank

The international bank sends the funds across the border,[10] as shown in the chart above, which helps to dispense with a large number of regulatory problems.

At the local level, centralisation can be tailored to the specific regulatory requirements in each country, while at a higher level the international bank can carry out both notional pooling and daily account balancing. Lastly, it can manage the subsidiaries' interest and exchange rate risks (see Chapter 51) by offering exchange-rate and interest-rate guarantees. The structure set up can be used to manage all the group's financial issues rather than just the cash management aspects.

Within a fairly large area including the countries of the European Union, but also the United Kingdom, Switzerland, Norway, Iceland, the interconnection of payment systems under the aegis of the European Central Bank has made it possible to carry out fund transfers in real time, more cheaply and without having to face the issue of value dating. In the eurozone, cash pooling may thus be carried out with the assistance of a single concentration bank in each country with cross-border transfers not presenting any problems.

More and more groups have created a payment factory which pays off all the group's suppliers on behalf of all the subsidiaries, which reduces the number of transfers when subsidiaries have common suppliers.

4/ CASH MANAGEMENT OF A GROUP EXPERIENCING FINANCIAL DIFFICULTIES

We ought to mention that all of the techniques and products discussed in this chapter work best for a group in good financial health and which accordingly has easy access to the debt market.

The treasurer of a group whose finances are stretched also has to manage its cash with as much, if not more, care and attention, although the goals of such a treasurer will obviously be a lot different from those of the treasurer of a more financially sound group. Instead of seeking to optimise financial expenses, the treasurer will want to secure the group's financing.

Accordingly, the treasurer will maximise the amount of loans granted, even if this means taking out more short-term debt than is actually needed to

meet short-term requirements.

When the going gets tough, the group is able to draw on all of its credit lines, as long as it is still meeting its financial covenants,[11] and place the funds in short-term investments. So, if the situation gets worse, the group will not run the risk of having its credit lines cut off by the banks. The banks will be forced to work with the company in order to turn it around financially.

Looking after a company's cash turns out to be more of an operational monitoring job than an optimisation one. In fact, and paradoxically, the treasurer succeeds in managing the company's cash only thanks to its short-term investments.

This situation could raise the cost of debt for the company, but this additional cost is no more than a form of insurance against a liquidity risk!

The treasurer will, of course, at the same time work actively on the management of working capital, as we saw in Chapter 49.

Section 50.4 INVESTING CASH BALANCES

Financial novices may wonder why debt-burdened companies do not use their cash to reduce debt. There are two good reasons for this:

Paying back debt in advance can be costly because of early repayment penalties, or unwise if the debt was contracted at a rate that is lower than the rates prevailing today.

Keeping cash on hand enables the company to seize investment opportunities quickly and without constraints or to withstand changes in the economic environment. Some research papers[12] have demonstrated that companies with strong growth or volatile cash flows tend to have more available cash than average. Conversely, companies that have access to financial markets or excellent credit ratings have less cash than average.

Obviously, all financing products used by companies have a mirror image as investment products, since the two operations are symmetrical. The corporate treasurer's role in investing the company's cash is nevertheless somewhat specific, because the purpose of the company is not to make profits by engaging in risky financial investments. This is why specific products have been created to meet this criterion.

Remember that all investment policies are based on anticipated developments in the bank balances of each account managed by the company or, if it is a group, on consolidated, multicurrency forecasts. The treasurer cannot decide to make an investment without first estimating its amount and the duration. Any mistake, and the treasurer is forced to choose between two alternatives:

either resort to new loans to meet the financial shortage created if too much cash was invested, thus generating a loss (negative margin) on the difference between lending and borrowing rates (i.e. the interest rate spread); or

retrieve the amounts invested and incur the attendant penalties, lost interest or (in certain cases such as bond investments) risk of a capital loss.

Since corporate treasurers rarely know exactly how much cash they will have available for a given period, their main concern when choosing an investment is its liquidity – that is, how fast it can be converted back into

cash. **For an investment to be cashed in immediately, it must have an active secondary market or a redemption clause that can be activated at any time.**

> The corporate treasurer's first concern in investing cash is liquidity.

Of course, if an investment can be terminated at any time, its rate of return can be uncertain since the exit price can be uncertain. However, if the rate of return is set in advance, it is virtually impossible to exit the investment before its maturity, since there is no secondary market or redemption clause, or if there is, only at a prohibitive cost.

> The treasurer's second concern – security – is thus closely linked to the first. Security is measured in terms of the risk on the interest and principal.

Within the context of this liquidity-security, the treasurer should not forget that:

accounting standards strictly define investments that can be classified as cash equivalents: they must be short term (in general less than three months), very liquid, easily convertible into a known amount of cash and subject to a negligible risk of any change in value. This classification has consequences on the calculation of net debt (which can have an impact on the banking covenants and the company's credit rating);

the risk of a bank collapsing is not just a theoretical risk. A bank that offers substantially higher interest on deposits than its competitors may do so because it is having trouble finding cash, which is not a good sign. Counterparty risk also means that companies should choose carefully and diversify the banks they place their cash with and not put all of their eggs into one basket;

readily available products may fall under a different tax regime.

Note that the treasurer now faces negative short-term rates in Europe (as banks have started to charge for deposits). This encourages them to look at riskier or longer investments so that they do not have to take a loss on their

investment. But beware! In 2020, in Europe, investing a significant amount at 0% is certainly synonymous with taking risks.

1/ INVESTMENT PRODUCTS WITH NO SECONDARY MARKET

Interest-bearing current accounts (or simple current accounts) are offered by banks in order to be able to capture liquidity so as to improve their regulatory solvency ratios. Interest may be fixed or rise over time (extending the life of these deposits).

Time deposits are fixed-term deposits on an interest-bearing bank account that are governed by a letter signed by the account holder. The interest on deposits with maturity of at least one month is negotiated between the bank and the client. It can be at a fixed rate or indexed to the money market. No interest is paid if the client withdraws the funds before the agreed maturity date.

Cash certificates are time deposits that take the physical form of a bearer or registered certificate.

Repos (repurchase agreements) are agreements whereby institutional investors or companies can exchange cash for securities for a fixed period of time (a securities for cash agreement is called a “reverse repo”). At the end of the contract, which can take various legal forms, the securities are returned to their original owner. All title and rights to the securities are transferred to the buyer of the securities for the duration of the contract. The only risk is that the borrower of the cash (the repo seller) will default.

Repo sellers hold equity or bond portfolios, while repo buyers are looking for cash revenues. From the buyer's point of view, a repo is basically an alternative solution when a time deposit is not feasible, for example for periods of less than one month. A repo allows the seller to obtain cash immediately by pledging securities with the assurance that it can buy them back.

Since the procedure is fairly unwieldy, it is only used for large amounts, well above €2m. This means that it competes with negotiable debt securities, such as commercial paper. However, the development of money

market mutual funds investing in repos has lowered the €2m threshold and opened up the market to a larger number of companies.

2/ INVESTMENT PRODUCTS WITH A SECONDARY MARKET

Commercial papers are securities issued for periods ranging from one day to one year with fixed maturity dates and mainly issued by large companies and financial institutions.

Negotiable European medium-term notes have the same characteristics as commercial papers with the only difference that the duration is necessarily longer than one year (generally between one and two years).

We described the main characteristics of commercial paper and medium-term negotiable notes in Section 21.1.

Treasury bills and notes are issued by governments at monthly or weekly auctions for periods ranging from two weeks to five years. Depending upon the creditworthiness of the issuer (governments) they are the safest of all investments, but their other features make them less flexible and competitive. However, the substantial amount of outstanding negotiable Treasury bills and notes ensures sufficient liquidity, even for large volumes. These instruments can be a fairly good vehicle for short-term investments.

Money-market or cash mutual funds are funds that issue or buy back their shares at the request of investors at prices that must be published daily. The return on a money-market capitalisation mutual fund arises from the daily appreciation (or depreciation if interest rates are negative!) in net asset value (NAV). This return is similar to that of the money market. Depending on the mutual fund's stated objective, the increase in NAV is more or less steady. A very regular progression can only be obtained at the cost of profitability.

In order to meet its objectives, each cash mutual fund invests in a selection of Treasury bills, commercial papers, repos and variable or fixed-rate bonds with a short residual maturity. Its investment policy is backed by quite sophisticated interest-rate risk management.

The subprime crisis was a healthy (but costly!) reminder for some treasurers that an increase in return cannot be obtained without an increase in risk.

Some money-market funds, nicknamed “turbo” or “dynamic”, had invested part of their portfolio in subprime securities to boost their returns. During the summer of 2007 and thereafter, their performances suffered severely and the majority of them lost most of their customers.

Securitisation vehicles are special-purpose vehicles created to take over the claims sold by a credit institution or company engaging in a securitisation transaction (see Section 21.3). In exchange, these vehicles issue units that the institution sells to investors.

In theory, **bond** investments should yield higher returns than money-market or money-market-indexed investments. However, interest-rate fluctuations generate capital risks on bond portfolios that must be hedged, unless the treasurer has opted for short-maturity bonds or floating-rate bonds. Investing in bonds therefore calls for a certain degree of technical know-how and constant monitoring of the market. Only a limited number of treasurers have the resources to invest directly in bonds for which default risk is far from being negligible.

The high returns arising from investing surplus cash in the **equity** market over long periods become far more uncertain on shorter horizons, when the capital risk exposure is very high. Equity investments are theoretically only used very marginally and only for surplus cash over the long term. However, treasurers may be charged with monitoring portfolios of equity interests.

The current context of very low or even negative interest rates is forcing treasurers to think about the maximum level of acceptable risk. Some banks will even decline deposits (beyond a certain amount justified by day-to-day business) so that they don't have to impose negative rates, others have taken the plunge and are applying negative interest rates to deposits when they go above a certain threshold!

Section 50.5 THE CHANGING ROLE OF THE TREASURER

Technological developments have resulted in greater integration and automation in the management of a company's cash, and have also facilitated the centralisation of the process.

Large groups appear to be centralising cash management as much as they possibly can (which has no impact outside the group). However, this was just a start, and many groups have now also started centralising trade payables. In Europe, thanks to SEPA, we are seeing the centralisation of both payables and receivables. This would be rather more difficult to set up as it requires the cooperation of customers who will have to send their payment, not to the company that has supplied it with the goods or services it has ordered, but to another company.

Some groups view cash management as a complex administrative function that generates additional risks. Some large groups have, quite simply, outsourced the cash management function, either to banks or to consulting firms offering off-the-shelf solutions for outsourced cash management. But most groups consider this function as strategic. The Covid-19 crisis has reinforced this position.

Since the early 2000s, however, there has also been a democratisation of cash centralisation. With the development and greater security of the Internet, SMEs that do a lot of business on the international market have been able to set up efficient systems at a lower cost.

In addition to optimising cash flow, it is the treasurer's responsibility to put in place procedures to prevent fraud and to identify compliance issues. Since 2019, there has been an increase in fraud (ransomwares, CEO fraud, etc.), which has brought this subject to the forefront.

SUMMARY

The summary of this chapter can be downloaded from www.vernimmen.com.

A treasurer's job is to perform the following tasks:

forecast trends in the credit and debit balances of the company's accounts;

keep dormant funds to a minimum;

invest excess cash as efficiently as possible;

finance borrowing requirements as cheaply as possible.

Cash balances for treasury purposes are not the same as the balances shown in a company's accounts or the accounting balance of its assets held by the bank. In particular, treasurers must take account of value dating. The value date is the date from which a credited amount accrues interest when paid into an interest-bearing account or becomes available when paid into a demand account.

The aim of the cash budget is to determine the amount and duration of cash requirements and surpluses. The cash budget shows all the receipts and all the disbursements that the business expects to collect or make. Day-to-day forecasting, which takes into account value dating, requires paying considerable attention to the payment methods used. Forecasts are more reliable when the treasurer has the initiative both for setting up a payment and carrying out the fund transfer.

Account balancing is the final stage in the liquidity management process. It eliminates the additional costs derived from differences between borrowing and investment rates. Lastly, optimised cash management entails the acceleration of the collection process and the extension of suppliers' payment deadlines.

Cash pooling – the centralisation of subsidiaries' account balances within a group – is comparable to the process of balancing all of a subsidiary's accounts. Pooling is generally backed up by an integrated information system and a group-wide agreement concerning banking terms and conditions. At the international level, regulatory difficulties concerning some cross-border transfers prevent the direct balancing of

subsidiaries' accounts. Instead, the initial pooling process is carried out by a local bank in each country, and then the resulting balances are pooled by an international banking group.

The corporate treasurer's first concern when investing cash is liquidity. The treasurer's second concern – security – is thus closely linked to the first. Security is measured in terms of the risk on the interest and principal. Products that can be used can be split between products with a secondary market (interest-bearing current accounts, Treasury bills, money-market funds, commercial papers, etc.) or without (time deposit, repos, etc.).

QUESTIONS

1/What are the three key objectives of a corporate treasurer?

2/What are the three cash positions for a company?

3/What is a value date?

4/What is a concentration account?

5/What is the main difference between national group pooling and international group pooling?

6/Does perfect daily balancing of accounts cost more or less than perfect notional pooling?

7/Is the risk of bankruptcy of a subsidiary an obstacle to cash pooling for a group which balances its accounts daily?

8/What is the main argument against full cash pooling for a group?

9/What sort of cash organisation is generally in place for highly decentralised groups?

10/What common practice is the principal of value dates based on?

11/Is an investment that can be quickly sold on a vast market without risk?

12/Can an investment yield more than a debt? What is then the consequence?

13/Why do treasurers avoid investing their cash in shares?

14/In 2006, ABN AMRO created a new financial product, the “constant proportion debt obligation”, rated AAA by Standard & Poor's and yielding 1% to 2% more than a AAA-rated bond. What do you think?

15/As treasurer of the city of Manheim in North Rhine-Westphalia (42,000 inhabitants), you have €38m in cash. All German banks charge 0.5% per annum for deposits; all except Greensill Bank. What do you do?

16/In an environment with very low interest rates, what might the treasurer be tempted to do?

You'll find more questions at www.vernimmen.com.

ANSWERS

Questions

1/*To reduce dormant funds to a minimum, to optimise the cost of financing and investing cash balances, to optimise the cost of risk management.*

2/*Value dating accounts, accounting records, company's bank accounts.*

3/*The date from which a credit amount starts to bear interest and a debit amount ceases to bear interest.*

4/*An account used for balancing cash positions.*

5/*The level of pooling.*

6/*In both cases: no financial expenses since accounts are balanced.*

7/*No, as reciprocal guarantees between each of the companies participating in the pooling arrangements can be set up.*

8/*Disempowering of subsidiaries in the management of their liquidity leading to lower local efficiency in generating cash.*

9/*Cash pools that can be used upon request.*

10/*Clearing cheques.*

11/*No, as the liquidity risk does not erase all the other risks that may result in a change in value.*

12/*Yes if the risk of the investment is higher than that of the borrower.*

13/*High short- and medium-term risk.*

14/*It was either a fabulous arbitrage opportunity or an investment with a higher risk than apparent. In early 2008, CPDOs were valued at 40–75% of face value. Their risk, counterparty of their return, had been severely underestimated.*

15/*Such a gap is suspicious and is probably due to a lower creditworthiness and notoriety of Greensill Bank. As a treasurer has difficulty in doing a financial analysis of a bank, it is better to be cautious and not to take this risk despite a higher remuneration! Greensill Bank went bankrupt in March 2021 and the treasurer in Manheim lost all the funds he had invested there.*

16/*To take more risks in investing in securities with longer maturity, which may then be reclassified as financial fixed assets or towards counterparts of lesser quality. Both should be avoided.*

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NOTES

1 *European Union, Switzerland, Norway, Ireland, Monaco and Liechtenstein.*

2 *Also called transactional account, current account, checking account.*

3 *When a bank lends some money, it uses part of the bank equity because it has to constitute a minimum solvency ratio (equity/weighted assets).*

4 *Enterprise resource planning.*

5 *Order given by the customer to its bank to debit a sum from its account and to credit another account.*

6 *Payment method whereby a debtor asks its creditor to issue standing orders and its bank to pay the standing orders.*

7 *Promissory note on a magnetic strip.*

8 *An invoice that must be paid at a particular place.*

9 *Small and medium-sized enterprises.*

10 *For currencies that are freely convertible.*

11 *See Section 39.2.*

12 *Opler et al. (1999).*

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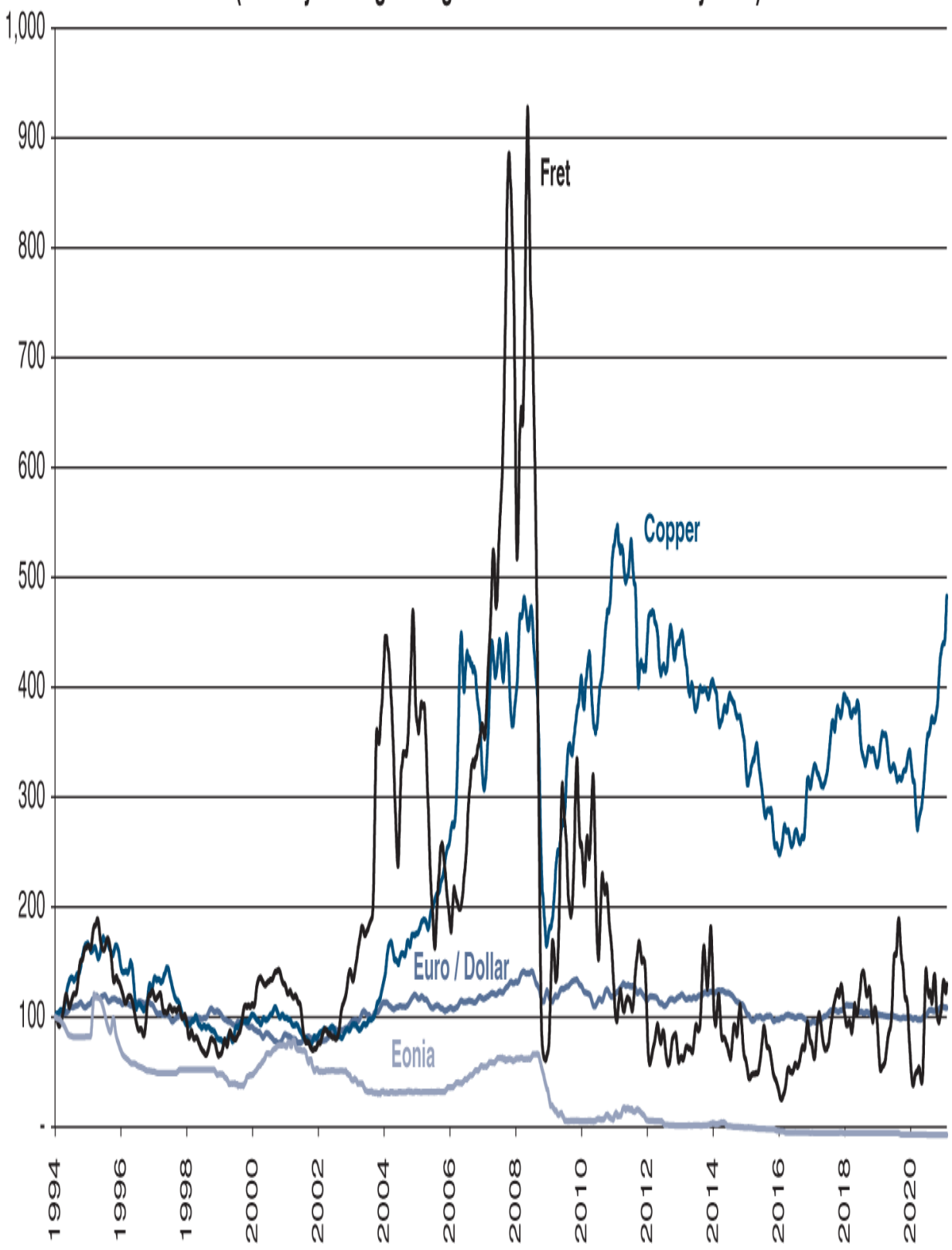
Chapter 51
MANAGING FINANCIAL RISKS

The worst is never certain

The graph below illustrates the high volatility of some parameters of importance for the profit and loss account of companies: exchange rate (dollar/euro), interest rate (Eonia), raw materials (copper) and services (freight rates).


Example of volatility: Copper, Fret, Euro-Dollar FX and EONIA price evolution
(Monthly moving average – rebased as of 1 February 1994)
1,000
900
800
700
600
500
400
300
200
100
-
Fret
Copper
Euro / Dollar
Eonia
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020

Source: Data from Factset – copper spot price in $ per MT: London Metal Exchange – Fret price: Baltic Dry Index

Investors, supervisory authorities and managers pay more and more attention to risk management. This has led to:

management teams' awareness of the importance of risk monitoring that leads to the setting up or the reinforcement of departments dedicated to risk management (internal audit, risk managers);

strong pressure from capital markets to show transparency. Good governance advice for reinforced supervision of directors in the management of risks through the implementation of risk audit committees;

a regulatory framework imposing communication on procedures to identify and assess risks for the firm and on strategy for management of those risks and its efficiency. The “risk factors” section of universal registration documents, and of share or bond issue prospectuses has thus become a vital section.

The evolution of risk management in recent years has consisted in increasingly segmenting risks and developing products that offer more accurate and flexible hedging for risk that in the past had not always been well assessed.

Section 51.1 INTRODUCTION TO RISK MANAGEMENT

1/ DEFINITION OF RISK

The key features of risk are:

intensity of the possible loss on the amount of the exposure;

frequency, which is the likelihood of this loss occurring (insurers talk about loss probability).

Risk can be classified into four major categories:

Risk fundamentally linked to market changes (interest and exchange rates, raw material prices). The likelihood of occurrence of fundamental risk, i.e. the probability that the market will move against the interests of the company, is mechanically close to 50%. The intensity of the loss will depend on the volatility of the market in question.

Loss probability refers to the likelihood of the loss occurring on a recurrent basis (such as losses on bad debts, the unknown losses suffered by mass market retailers on marked-down products, damage caused to vehicles by car rental companies, etc.). This is more of a statistical cost than a risk. The real risk is the possibility that a probable loss will occur more suddenly than usual, hence its name.

Volatility risk is a risk that materialises during an exceptional year (unusual late frost). This sort of risk should always be covered.

A disaster risk materialises once a century (for example, a pandemic) but it can have a very high level of intensity. It is difficult to cover[1] and it is not unusual for the risk of a disaster occurring to be only partially covered, or not covered at all, given the fact that it is very unlikely to occur.

2/ RISK MANAGEMENT STEPS

The different steps involved in risk management are as follows:

Identification: the map-making work involved in risks. Once the intensity and probability of the risk has been identified and determined, it can be classified.

Determination of existing internal controls and procedures which will help to mitigate the risk. This step involves assessing and testing existing internal controls (adequacy and efficiency). Controls should, in fact, lead to the substantial reduction (and generally at a low cost) of most risks, acting as a sort of filter. So it would be counterproductive for a company to insure its losses on receivables if it hadn't put in place basic controls to ensure their recovery (monitoring of outstanding payables, sending out reminders, etc.).

Prevention is often the best form of internal control. There is the very telling example of the manager of a transport firm who sent all of his drivers off for driving lessons in order to reduce the firm's accident rate. In finance departments, teams receive regular training on the types of fraud that are possible (in particular “fake CEO” scams whereby a fraudster poses as a company executive and asks an employee to transfer money in strict confidence).

Determination of a residual risk and assessment: internal control generally manages and eliminates a large part of the risk that is easy to master. This leaves the company in a position where it can determine the residual risk. It then only has to assess the potential impact, which will be a determining factor in the final phase.

Definition of a management strategy: this involves finding the answers to two questions:

Am I in a position to manage this risk internally? If so, what is the cost?

Are there any tools that can be used to hedge against this risk? If so, what is the cost?

Managers will rely on an assessment of the relationship between the level of hedging and the cost of each strategy to help them come to a decision. However, the choice of whether to cover a risk or not is not a simple yes or no decision, as it may first appear. Often, the best solution turns out to be an intelligent combination of a number of options.

However, issues relating to corporate image and communication may interfere with this purely economic reasoning. For example, a company may have to opt for more expensive hedging if this ties in with its image as a good corporate citizen. There are also some financial directors who may

question whether the company should take out insurance against certain risks that will need to be booked at fair value (as required under IFRS 9) and which would be likely to introduce high levels of volatility on the income statement!

Insuring against risks helps to limit the volatility of earnings and/or cash flows. Nevertheless, the reader, who will by now have developed the reasoning of a skilled theoretician, could quite rightly point out that, as the risks covered are by nature diversified risks, eliminating them through insurance is not remunerated by the investor in the form of a lower required rate of return.[2] In other words, the coverage does not create value. This is true from a purely logical point of view of efficient markets, in particular when the investor has perfect information on the risks borne by the company.

Looking at the issue in terms of agency theory, it is clear that managers should reduce the volatility of cash flows. Even if the hedging decision does not create value, a company that is less exposed to the ups and downs of the market is, from a manager's point of view, in a more comfortable position. Comprehensive insurance will enable management to implement a long-term strategy by reducing the likelihood of bankruptcy and reducing the personal risk of managers.

Campello *et al*. (2011) have demonstrated that a company that hedges its financial risks benefits from a lower cost of debt and from less restrictive covenants. Lenders do not like specific risks.

Finally, Rountree *et al*. (2008) have shown that an increase by 1% of the volatility of cash flows results in a decrease of enterprise value by 0.15%. Shareholders do not like the lack of hedging either, and it is rare that a company does not hedge, at least partially, the financial risks that it can hedge. This is often simply a sign that management is managing the company closely.

3/ THE DIFFERENT TYPES OF RISK

Risks run by companies can be split into five categories:

Market risk is exposure to unfavourable trends in product prices, interest rates, exchange rates, raw material prices or stock prices. Market risk occurs at various levels:

- a position (a debt, for example, or an expected receipt of revenue in foreign currencies, etc.);
- a business activity (e.g. purchases paid in a currency other than that in which the products are sold); or
- a portfolio (short- and long-term financial holdings).

Counterparty or credit risk. This is the risk of loss on an outstanding receivable or, more generally, on a debt that is not paid on time. It naturally depends on three parameters: the amount of the debt, the likelihood of default and the portion of the debt that will be collected in the event of a default.

Liquidity risk is the impossibility at a given moment of meeting a debt payment, because:

- the company no longer has assets that can rapidly be turned into cash;
- a financial crisis (a market crash, for example) has made it very difficult to liquidate assets, except at a very great loss in value; or
- it is impossible to find investors willing to offer new funding. Markets are then closed, as in Autumn 2008 (this was largely avoided mid-2020 thanks to States' reactivity).

Operating risks: these are risks of losses caused by errors on the part of employees, systems and processes, or by external events. They include:

- risk of deterioration of industrial facilities (accident, fire, explosion, etc.) or other assets (ransomware) that may also cover the risk of a temporary halt in business;
- technological risk: am I in a position to identify/anticipate the arrival of new technology which will make my own technology redundant?
- climate risks that may be of vital importance in some sectors, such as agriculture or the leisure sector (what sort of insurance should ski resorts take out?);
- environmental risks: how can I ensure that I'm in a position to protect the environment from the potentially harmful impact of my activity? Am I in a position to certify that I comply with all environmental statutes and regulations in force?

Country risk (and in particular political risk), regulatory and legal risks): these are risks that impact on the immediate environment of the company and that could substantially modify its competitive situation and even the business model itself.

Section 51.2 MEASURING FINANCIAL RISKS

We will now focus on financial risks.

Different financial risks are measured in very different ways. Measurement is quite sophisticated for market risks, for example, with the notion of position and value at risk (VaR), and for liquidity risks, less sophisticated for counterparty risks and quite unsatisfactory for other risks. Most risk measurement tools were initially developed by banks – whose activities make them highly exposed to financial risks – before being gradually adopted by other companies.

1/ POSITION AND MEASUREMENT OF MARKET RISKS

Market risk is exposure to fluctuations in the value of an asset called the underlying asset. An operator's **position** is the residual market exposure on the balance sheet at any given moment.

When an operator has bought more in an underlying asset than they have sold, they are **long** (for interest or exchange rate a long position is when the underlying asset is worth more than the corresponding liability). It is possible, for example, to be long in euros, long in bonds or long three months out (i.e. having lent more than borrowed three months out). The market risk on a long position is the risk of a fall in market value of the underlying asset (or an increase in interest rates).

On the other hand, when an operator has sold more in the underlying asset than they have bought, they are said to be **short**. The market risk on a short position is the risk of an increase in market value of the underlying asset (or a fall in interest rates).

The notion of position is very important for banks operating on the fixed-income and currency markets. Generally speaking, traders are allowed to keep a given amount in an open position, depending on their expectations. However, clients buy and sell products constantly, each time modifying traders' positions. At a given moment, a trader could even have a position that runs counter to their expectations. Whenever this is the case, they can close out their position (by realising a transaction that cancels out their position) in the interbank market.

2/ COMPANIES' MARKET POSITIONS

Like banks, at any given moment an industrial company can have positions vis-à-vis the various categories of risk (the most common being currency and interest-rate risk). These positions are a natural consequence of its business activities, financing and the geographical location of its subsidiaries. A company's aggregate position results from the following three items:

its commercial position;

its financial position;

its accounting position.

Let us first consider currency risk. Exposure to currency risk arises first of all from the purchases and sales that a company makes in foreign currencies in the course of carrying out its business activities. Let us say, for example, that a eurozone company is due to receive $10m in six months, and has no dollar payables at the same date. That company is said to be long in six-month dollars. Depending on the company's business cycle, the actual timeframe can range from a few days to several years (if the order backlog is equivalent to several years of revenues). The company must therefore quantify its total currency risk exposure by setting receipts against expenditure, currency by currency, at the level of existing billings and forecast billings. By doing so, it obtains its **commercial currency position**.

However, the company's commercial exchange position goes well beyond the one-off transaction described above. Take, for example, a company such as Airbus, which gets its revenues in dollars but pays its costs in euros. Even if it hedges against foreign exchange losses on its orders, it will still be exposed over the long term to fluctuating exchange rates. Its commercial position is thus structural and it is obvious that this position is even more precarious when the company's competitors are not in the same position. Boeing, for example, has the majority of its revenues and costs in dollars.

Hedging of commercial cash flows that are not contractual rarely covers over a few quarters, as this would be taking too high a risk if exchange rates were to move in the wrong direction. In the event of negative movements in the hedged currencies, the hedge gives the firm time to take corrective actions: increase sales prices, delocalise production, reduce costs, bill clients in a different currency, etc.

Under IFRS, the use of hedge accounting relating to hedges of transactions not yet entered into requires a realistic budget. In practice, this requirement is a disincentive as it is difficult to establish a realistic budget beyond one year.

There is also a risk in holding financial assets and liabilities denominated in foreign currencies. If our eurozone company has raised funds in dollars, it is now short in dollars, as some of its liabilities are denominated in dollars with nothing to offset them on the asset side. The main sources of this risk are: (1) loans, borrowings and current accounts denominated in foreign currencies, with their related interest charges; and (2) investments in foreign currencies. Taken as a whole, these risks express companies' **financial currency position**.

The third component of currency risk is **accounting currency risk**, which arises from the consolidation of foreign subsidiaries. Equity denominated in foreign currencies, dividend flows, financial investments denominated in foreign currencies and currency translation differences[3] give rise to accounting currency risk. Note, however, that this is reflected in the currency translation differential in the consolidated accounts and therefore has no impact on net income.

The same thing can apply to the interest rate risk. The **commercial interest rate risk** depends on the level of inflation of the currencies in which the goods are bought and sold, while the **financial interest rate** is obviously tied directly to the terms a company has obtained for its borrowings and investments. Floating-rate borrowings, for example, expose companies to an increase in the benchmark rate, while fixed-rate borrowings expose them to opportunity cost if they cannot take advantage of a possible cut in rates.

In addition to currencies and interest rates, other market-related risks require companies to take positions. In many sectors, for example, raw material prices are a key factor. A company can have a strategically important position in oil, coffee, semiconductors or electricity markets, for example.

3/ VALUE AT RISK (VAR) AND CORPORATE VALUE AT RISK

VaR is a finer measure of market risk. It represents an investor's maximum potential loss on the value of an asset or a portfolio of financial assets and liabilities, based on the investment timeframe and a confidence interval. This potential loss is calculated on the basis of historical data or deduced from normal statistical laws.

Hence, a portfolio worth €100m with a VaR of €2.5m at 95% (calculated on a monthly basis) has just a 5% chance of shrinking more than €2.5m in one month.

VaR is often used by financial establishments as a tool in managing risk. VaR is beginning to be used by major industrial groups. Engie, for example, includes it in its annual reports. However, VaR has two drawbacks:

it assumes that the markets follow normal distribution laws, an assumption that underestimates the frequency of extreme values (see Section 23.5, 2/);

it tells us absolutely nothing about the potential loss that could occur when stepping outside the confidence interval.

Based on the above example, how much can be lost in those 5% of cases: €3m, €10m or €100m? VaR tells us nothing on this point, but stress scenarios can then be implemented. Stress test computations (sensitivity, worst-case scenarios) can complete the information from the VaR. The average loss beyond the confidence interval (expected shortfall) measures the average loss over a certain period in *x*% of worst cases. The expected shortfall of €10m over one month and 5% means that over one month, the portfolio has a probability of 5% of suffering an average loss of €10m.

In the same way, some firms compute earnings at risk, cash flows at risk and corporate value at risk to measure the impact of adverse effects on

earnings, cash flows and value over a longer period than for banks: from several months up to a year.

4/ MEASURING OTHER FINANCIAL RISKS

Liquidity risk is measured by comparing contractual debt maturities with estimated future cash flow, via either a cash flow statement or curves such as those presented in Section 12.2. Contracts carrying financial or rating covenants must not be included under debt maturing in more than one year because a worsening in the company's ratios or a downgrade could trigger early repayment of outstanding loans.

In addition to conventional financial analysis techniques and credit scoring, credit and counterparty risk is measured mainly via tests that break down risks. Such tests include the proportion of the company's top 10 clients in total receivables, the number of clients with credit lines above a certain level, etc.

Country risk is generally measured by a rating (most of the time provided by a third party) taking into account, among other things, the stability of governments, the recurrence of wars and other crises.

The measure of legal and regulatory risk is still in its infancy.

Section 51.3 PRINCIPLES OF FINANCIAL RISK MANAGEMENT

Financial risk management comes in four forms:

avoidance: do not expose yourself (when possible!) to the risk concerned. This strategy generally consists of refraining from developing a business in certain countries or with certain customers, or disposing of the risky asset or liability. For example, some banks have been able to sell entire portfolios of loans in order to remove counterparty risks from their balance sheet;

self-hedging, a seemingly passive stance that is taken only by a few, very large, companies and only on some of their risks;

locking in prices or rates for a future transaction, which has the drawback of preventing the company from benefiting from a favourable shift in prices or rates;

insurance, which consists in paying a premium in some form to a third party, which will then assume the risk, if it materialises; this approach allows the company to benefit from a favourable shift in prices or rates;

1/ AVOIDANCE

An expedient solution if ever there was one, but disposal will not disconnect the holding of the asset (or the liability) from the management of its risk. It overlaps with securitisation without recourse, discounting without recourse and factoring without recourse (see Section 21.3).

Avoidance also involves fixing a minimum rating for granting a customer loan (or at the very least to set a credit limit per customer), or imposing the currency for settlement so as not to incur foreign exchange risks.

2/ SELF-HEDGING

Self-hedging is only a strategy for hedging against risk when it is deliberately chosen by the company or when there is no other alternative (uninsurable risks). It can be structured to a greater or lesser extent. At one extreme, we get risk taking (no hedging after the risk has been analysed) and at the other, the setting up of a captive insurance scheme.

Self-hedging consists, in fact, in not hedging a risk. This is a reasonable strategy but only for very large groups. Such groups assume that the law of averages applies to them and that they are therefore certain to experience some negative events on a regular basis, such as devaluations, customer bankruptcy, etc. Risk thus becomes a certainty and, hence, a cost. Rather than paying what amounts to an insurance premium, the company provisions a sum each year to meet claims that will inevitably occur, thus becoming its own insurer.

The risk can be diminished, but not eliminated, by natural hedges. A European company, for example, that sells in the US will also produce there, so that its costs can be in dollars rather than euros. It will take on debt in the US rather than in Europe, to set dollar-denominated liabilities against dollar-denominated assets.

> Self-hedging is a strategy adopted by either irresponsible companies or a limited number of very large companies who serve as their own insurance company!

One sophisticated procedure consists in setting up a **captive insurance (or reinsurance) company**, which will invest the premiums thus saved to build up reserves in order to meet future claims. In the meantime, some of the risk can be sold on the reinsurance market.[4]

A **captive insurance** company is an insurance or reinsurance company that belongs to an industrial or commercial company whose core business is not insurance. The purpose of the company's existence is to insure the risks of the group to which it belongs. This sort of setup sometimes becomes necessary because of the shortcomings of traditional insurance:

some groups may be tempted to reduce risk prevention measures when they know that the insurance company will pay out if anything goes wrong;

coverage capacities are limited and some risks are no longer insurable, for example gradual pollution or pandemics;

good risks end up making up for bad risks.

The scheme works as follows: the captive insurance company collects premiums from the industrial or commercial company and its subsidiaries,

and covers their insurance losses. Like all insurance companies, it reinsures part of its risks with international reinsurance companies. A captive insurance setup has the following advantages:

much greater efficiency (involvement in its own loss profile, exclusion of credit risk, reduction of overinsurance, tailor-made policies);

access to the reinsurance market;

greater independence from insurance companies (having them compete against each other);

reduction in vulnerability to cycles on the insurance market;

possibility of tax optimisation;

spreading the impact of losses over several financial years.

Walt Disney, or Volkswagen and over 350 European groups use this type of vehicle to manage risks limited to a few million euros. But captive insurances are also used by smaller groups offering their customers insurance as a side product (car rental, sale of household appliances, etc.).

3/ LOCKING IN FUTURE PRICES OR RATES THROUGH FORWARD TRANSACTIONS

Forward transactions can fully eliminate risk by locking in now the price or rate at which a transaction will be made in the future. This costs the company nothing but does prevent it from benefiting from a favourable shift in price or rates.

Forward transactions sometimes defy conventional logic, as they allow one to “sell” what one does not yet possess or to “buy” a product before it is available. As we will show, forward transactions can be broken down into the simple, familiar operations of spot purchasing or selling, borrowing and lending.

(a) Forward currency transactions

Let us take the example of a US company that is to receive €100m in three months. Let's say the euro is currently trading at $1.0198. Unless the company treasurer is speculating on a rise in the euro, they want to lock in today the exchange rate at which they will be able to sell these euros. So

they offer to sell euros now that they will not receive for another three months. This is the essence of the forward transaction. Although forward transactions are common practice, it is worth looking at how they are calculated.

> The transaction is tantamount to borrowing today the present value in euros of the sum that will be received in three months, exchanging it at the current rate and investing the corresponding amount in dollars for the same maturity.

Assume A is the amount in euros received by the company, N the number of days between today and the date of receipt, $R_€$ the euro borrowing rate and $R_\$$ the dollar interest rate.

The amount borrowed today in euros is simply the value A, discounted at rate $R_€$:

$$\mathrm{PV} = A/(1 + (R_€ \times N/360))$$

This amount is then exchanged at the R_S spot rate and invested in dollars at rate $R_\$$. Future value is thus expressed as:

$$\mathrm{FV} = R_S \times \mathrm{PV} \times (1 + (R_\$ \times N/360))$$

Thus:

$$\mathrm{FV} = A \times R_S \times \frac{1 + R_\$ \times \frac{N}{360}}{1 + R_€ \times \frac{N}{360}}$$

The forward rate (F_R) is that which equalises the future value in euros and the amount A:

$$F_R = R_S \times \frac{1 + R_\$ \times \frac{N}{360}}{1 + R_€ \times \frac{N}{360}}$$

Thus: If R_S = \$1.0198, N = 90 days, $R_\$$ = 2.03% and $R_€$ = 0.38%, we obtain a forward selling price of \$1.0240.

A forward purchase of euros, in which the company treasurer pledges to buy euros in the future, is tantamount to the treasurer buying the euros today while borrowing their corresponding value in dollars for the same period. The euros that have been bought are also invested during this time at the euro interest rate.

> The forward exchange rate of a currency is based on the spot price and the interest-rate differential between the foreign currency and the benchmark currency during the period covered by the transaction.

In our example, as interest rates are higher in dollars than in euros, the forward euro-into-dollar exchange rate is higher than the spot rate. The difference is called **swap points**. In our example, swap points come to 42 (0198 − 0240). Swap points can be seen as the compensation demanded by the treasurer in the forward transaction for borrowing in a high-yielding currency (the euro in our example) and investing in a low-yielding currency (the dollar in our example) up to the moment when the transaction is unwound. More generally, if the benchmark currency offers a lower interest rate than the foreign currency, the forward rate will be below the spot rate. Currency A is said to be at discount vis-à-vis currency B if A offers higher interest rates than B during the period concerned.

Similarly, currency A is said to be at premium vis-à-vis currency B if interest rates on A are below interest rates on B during the period concerned.

As in any forward transaction, treasurers know at what price they will be able to buy or sell their currencies, but will be unable to take advantage of any later opportunities. For example, if a treasurer sold €100m forward at \$1.0240, and the euro is trading at \$1.0460 at maturity, they will have to

keep their word (unless they want to break the futures contract, in which case they will have to pay a penalty) and bear an opportunity cost equal to $0.0220 per euro sold.

(b) Forward-forward rate and FRAs

Let us say that our company treasurer learns their company plans to install a new IT system, which will require a considerable outlay in equipment and software in three months. The cash flow projections show that, in three months, they will have to borrow €20m for six months.

On the euro money market, spot interest rates are as follows:

3 months	1.35%–1.55%
6 months	1.63%–1.83%
9 months	1.81%–2.05%

How can the treasurer hedge against a rise in short-term rates over the next three months? Armed with knowledge of the yield curve, they can use the procedures discussed below to lock in the six-month rate as it will be in three months.

The treasurer decides to borrow €20m today for nine months and to reinvest it for the first three months. Assuming that they work directly at money-market conditions, in nine months they will have to pay back:

$$20 \times (1 + 2.05\% \times 9/12) = €20.3075\text{m}$$

But their three-month investment turns €20m into:

$$20 \times (1 + 1.35\% \times 3/12) = €20.0675\text{m}$$

The implied rate obtained is called the forward-forward rate and is expressed as follows:

$$T(3.6) = ((20.3075 - 20.0675)/20.0675) \times (12/6) = 2.39\%$$

Our treasurer was thus able to hedge the exchange-rate risk but has borrowed €20m from the bank, €20m that they will not be using for three months. Hence, they must bear the corresponding intermediation costs. **The**

company's balance sheet and income statement will be affected by this transaction.

Now let us imagine that the bank finds out about our treasurer's concerns and offers the following product:

in three months' time, if the six-month (floating benchmark) rate is above 2.39% (the guaranteed rate), the bank pledges to pay the difference between the market rate and 2.39% on a predetermined principal;

in three months' time, if the six-month (floating benchmark) rate is below 2.39% (the guaranteed rate), the company will have to pay the bank the difference between 2.39% and the market rate on the same predetermined principal.

This is called a **forward rate agreement (FRA)**. An FRA allows the treasurer to hedge against fluctuations in rates, without the amount of the transaction being actually borrowed or lent.

If, in three months' time, the six-month rate is 2.5%, our treasurer will borrow €20m at this high rate but will receive, on the same amount, the pro-rated difference between 2.5% and 2.39%. The actual cost of the loan will therefore be 2.39%. Similarly, if the six-month rate is 1.5%, the treasurer will have borrowed on favourable terms, but will have to pay the pro-rated difference between 2.39% and 1.5%.

The same reasoning applies if the treasurer wishes to invest any surplus funds. Such a transaction would involve FRA lending, as opposed to the FRA borrowing described above.

> Forward rate agreements are used to lock in an interest rate for a future transaction.

The **notional amount** is the theoretical amount to which the difference between the guaranteed rate and the floating rate is applied. The notional amount is never exchanged between the buyer and seller of an FRA. The interest-rate differential is not paid at the maturity of the underlying loan but is discounted and paid at the maturity of the FRA.

An FRA is free of charge at set up but, of course, the “purchase” of an FRA and the “sale” of an FRA are not made at the same interest rate. As in all

financial products, a margin separates the rate charged on a six-month loan in three months' time and the rate at which that money can be invested over the same period of time.

Banks are key operators on the FRA market and offer companies the opportunity to buy or sell FRAs with maturities generally shorter than one year.

(c) Swaps

In its broadest sense, a swap is an exchange of financial assets or flows between two entities during a certain period of time. Both operators must, of course, believe the transaction to be to their advantage.

“Swap” in everyday parlance means an exchange of financial flows (calculated on the basis of a theoretical benchmark called a notional) between two entities during a given period of time. Such financial flows can be:

currency swaps without principal;

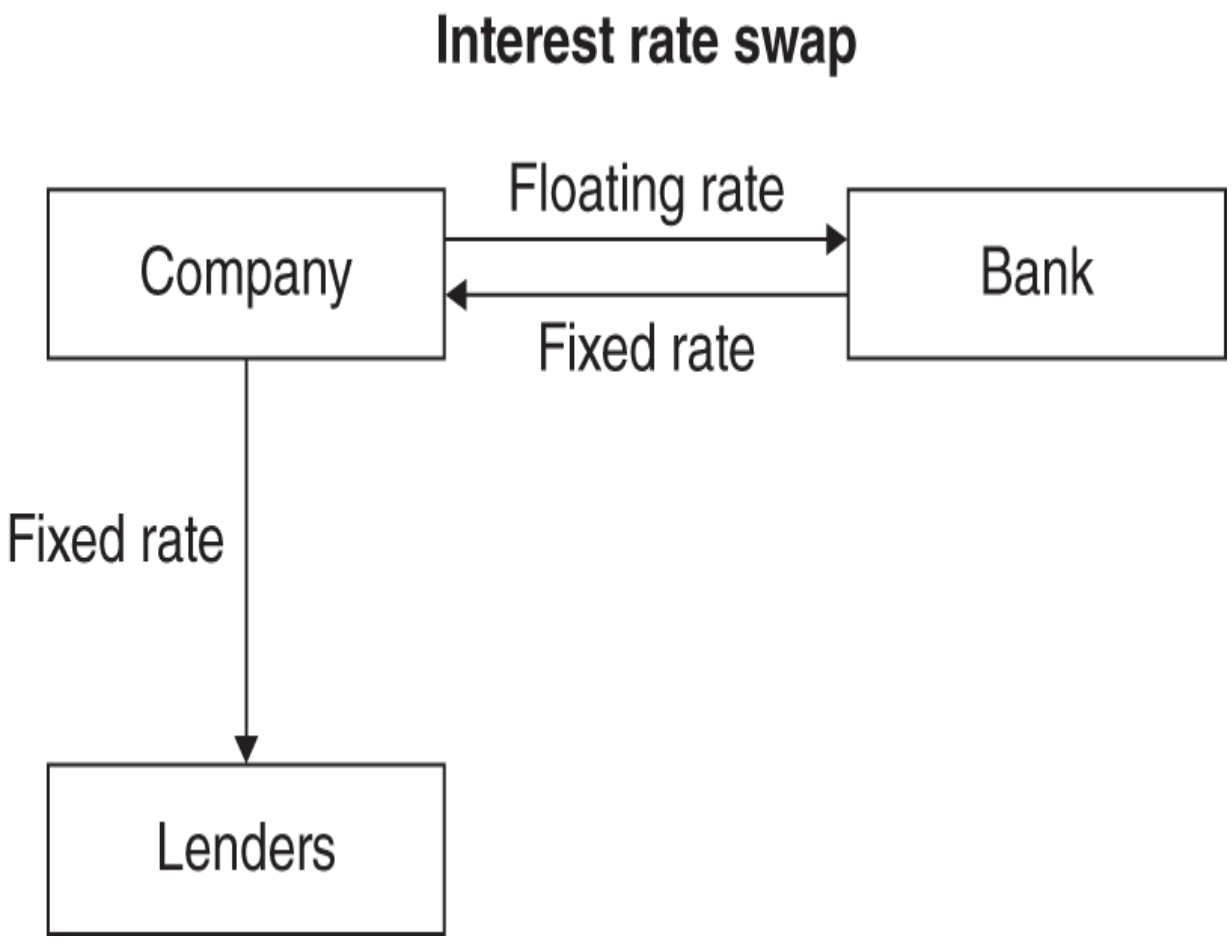
interest rate swaps (IRS);

currency swaps with principal.

> Unlike financial assets, financial flows are traded over the counter with no impact on the balance sheet,[5] and allow the parties to modify the exchange or interest rate terms (or both simultaneously) on current or future assets or liabilities.

Interest rate swaps are a long-term portfolio of FRAs (from one to 15 years).

As with FRAs, the principle is to compare a floating rate and a guaranteed rate and to make up the difference without an exchange of principal. Interest rate swaps are especially suited for managing a company's long-term currency exposure.



For a company with long-term debt (at *X*% fixed rate) and wishing to benefit from the fall in interest rates that it expects, the simplest solution is to receive the fixed rate (*X*%) on a notional amount and to pay the floating rate on the same amount.

That is:

$$\text{Fixed rate} - \text{Fixed rate} - \text{Floating rate} = -\text{Floating rate}$$

which is tantamount to our company borrowing the notional at a floating rate for the duration of the swap without its lenders seeing any change in their debts. After the first year, if the variable benchmark rate (SOFR, Euribor, etc.)[6] is $(X - 1)$%, the company will have paid its creditors an interest rate of *X*%, but will receive 1% of the swap's notional amount. Its effective rate will be $(X - 1)$%.

The transaction described is a swap of fixed for floating rates, and all sorts of combinations are possible:

swapping a fixed rate for a fixed rate (in the same currency);

swapping floating rate 1 for floating rate 2 (called benchmark switching);

swapping a fixed rate in currency 1 for a fixed rate in currency 2;

swapping a fixed rate in currency 1 for a floating rate in currency 2;

swapping a floating rate in currency 1 for a floating rate in currency 2.

These last three swaps come with an exchange of principal, as the two parties use different currencies. This exchange is generally done at the beginning and at the maturity of the swap at the same exchange rate. More sophisticated swaps make it possible to separate the benchmark rates from the currencies concerned.

The swaps market is very large and banks are key players. Company treasurers appreciate the flexibility of swaps, which allow them to choose the duration, the floating benchmark rate and the notional amount. Note, finally, that a swap between a bank and a company can be liquidated at any moment by calculating the present value of future cash flows at the market rate and comparing it to the initial notional amount. Swaps are also frequently used to manage interest rate risk on floating or fixed-rate assets.

The concept of the swap has been enlarged with **total return swaps**. Two players swap the revenues and change in value of two different assets they own during a certain period of time. One of the assets is generally a short-term loan, the other one can be a share price index, a block of shares, a portfolio of bonds, etc. Equity swaps thus make it possible to gain exposure to a share without having to acquire it.

Contingent futures contracts make it possible to hedge situations where the company is not certain it will carry out a transaction (e.g. acquisition via auction, call for tenders). The futures contract is entered into but lapses if the transaction does not take place.

4/ INSURANCE

Insurance allows companies to pay a premium to a third party, which assumes the risk if that risk materialises. If it doesn't, companies will lose the premium but can benefit from a favourable trend in the parameter hedged (exchange rate, interest rates, solvency of a debtor, etc.).

Conceptually, insurance is based on the technique of options; the insurance premium paid corresponds to the value of the option purchased.

As we saw in Chapter 23, an option gives its holder the right to buy or sell an underlying asset at a specified price on a specified date, or to forego this right if the market offers better opportunities. See Chapter 23 for background, valuation and conditions in which options are used.

Options may look like an ideal management tool for company treasurers, as they help guarantee a price while still leaving some leeway. But, as our reader has learned, there are no miracles in finance and the **option premium is the price of this freedom**. Its cost can be prohibitive, particularly in the case of companies operating businesses with low sales margins.

In addition, the premium must appear on the income statement, whereas a forward contract may, under certain conditions, be mirrored to its underlying asset in the books (hedge accounting).

Major international banks are market makers on all sorts of markets. Below we present the most commonly used options.

(a) Currency options

Currency options allow their holders to lock in an exchange rate in a particular currency while retaining the choice of realising a transaction at the spot market rate if it is more favourable. Of course, the strike price has to be compared with the forward rate and not the spot rate. Banks can theoretically list all types of options, although European-style options are the main ones traded.

While standardised contracts are listed, treasurers generally prefer the over-the-counter variety, as they are more flexible for choosing an amount (which can correspond exactly to the amount of the flow for companies), dates and strike prices. Options can be used in many ways. Some companies buy only options that are far out of the money and thus carry low premiums; in doing so, they seek to hedge against extreme events such

as devaluations. Other companies set the strike price in line with their commercial needs or perhaps their expectations.

Given the often high cost of the premium, several imaginative (and risky) products have been developed, including average strike options, lookback options, options on options and barrier options.

Average strike options[7] can be used to buy or sell currencies on the basis of the average exchange rate during the life of the option. The premium is thus lower, as less risk is taken by the seller and the buyer has a lower return potential.

Lookback options are options where the strike price is fixed at the lowest price reached by the underlying asset during the life of the call option, and at its highest price for a put option. This kind of option cancels all opportunity cost, consequently its premium is high.

Options on options are quite useful for companies bidding on a foreign project. The bid is made on the basis of a certain exchange rate, but let's say the rate has moved the wrong way by the time the company wins the contract. Options on options allow the company to hedge its currency exposure as soon as it submits its bid, by giving it the right to buy a currency option with a strike price close to the benchmark rate. If the company is not chosen for the bid, it simply gives up its option on the option. As the value of an option is below the value of the underlying asset, the value of an option on an option will be low.

Barrier options are surely the most frequently traded exotic products on the market. A barrier is a limit price which, when exceeded, knocks in or knocks out the option (i.e. creates or cancels the option). This reduces the premium.

It's easy to imagine various combinations of barrier options (e.g. knock-out barrier above the current price or knock-in barrier below; options at various strike prices, one activated at the level where the other is deactivated, etc.). When a bank offers a new currency product with a strange earnings profile (accumulators[8]), it is generally the combination of one (or several) barrier option(s) with other standard market products.

Barrier options are attractive but require careful management as treasurers must constantly keep up with exchange rates in order to maintain their

hedging situation (and to rehedge, if the option is knocked out). Moreover, their own risk-management tools would not necessarily tell them the exact consequences of these products or their implied specifications.

(b) Interest rate options

The rules that apply to options in general obviously apply to interest rate options. For the financial market, the exact nature of the underlying asset is irrelevant to either the design or valuation of the option. As a result, many products are built around identical concepts and their degree of popularity is often a simple matter of fashion.

A **cap** allows borrowers to set a ceiling interest rate above which they no longer wish to borrow and they will receive the difference between the market rate and the cap rate.

A **floor** allows lenders to set a minimum interest rate below which they do not wish to lend and they will receive the difference between the floor rate and the market rate.

A **collar or rate tunnel** involves both the purchase of a cap and the sale of a floor. This sets a zone of fluctuation in interest rates below which operators must pay the difference in rates between the floor rate and market rate and above which the counterparty pays the differential between the market rate and the cap rate. This combination reduces the cost of hedging, as the premium of the cap is paid partly or totally by the sale of the floor.

Do not be intimidated by these products, as the cap is none other than a call option on an FRA borrower. Similarly, the floor is just a call option on an FRA lender. As we have seen, these products allow operators to set a borrowing or lending rate vis-à-vis the counterparty. These options are frequently used by operators to take positions on the long part of the yield curve.

Swaptions are options on swaps, and can be used to buy or sell the right to conclude a swap over a certain duration. The underlying swap is stated at the outset and is defined by its notional amount, maturity and the fixed and floating rates that are used as benchmarks.

Some banks have combined swaps with *swaptions* to produce what they call swaps that can be cancelled at no cost. Do not be too impressed by the lack

of cost. This product is none other than a swap combined with an option to sell a swap. The premium of the option is not paid in cash but factored into the calculation of the swap rate.

Barrier interest rate options are similar to barrier currency options:

either the option exists only if the benchmark rate reaches the barrier rate; or

the option is knocked in only if the benchmark rate exceeds a set limit.

The presence of barriers reduces the option's premium. Company treasurers can combine these options with other products into a custom-made hedge. Like barrier currency options, barrier interest rate options often require careful management.

(c) Confirmed credit lines

In exchange for a commitment fee, a company can obtain short- and medium-term confirmed credit lines from banks, on which it can draw at any time for its cash needs. A confirmed credit line is like an option to take out a loan.

(d) Credit insurance

Insurance companies specialising in appraising default risk (Euler Hermes, Atradius, Coface, etc.) guarantee companies' payment of a debt in exchange for a premium equivalent between 0.1% and 2% of the nominal.

(e) Credit derivatives

Credit derivatives are used to unlink the management of a credit risk on an asset or liability from the ownership of that asset or liability.

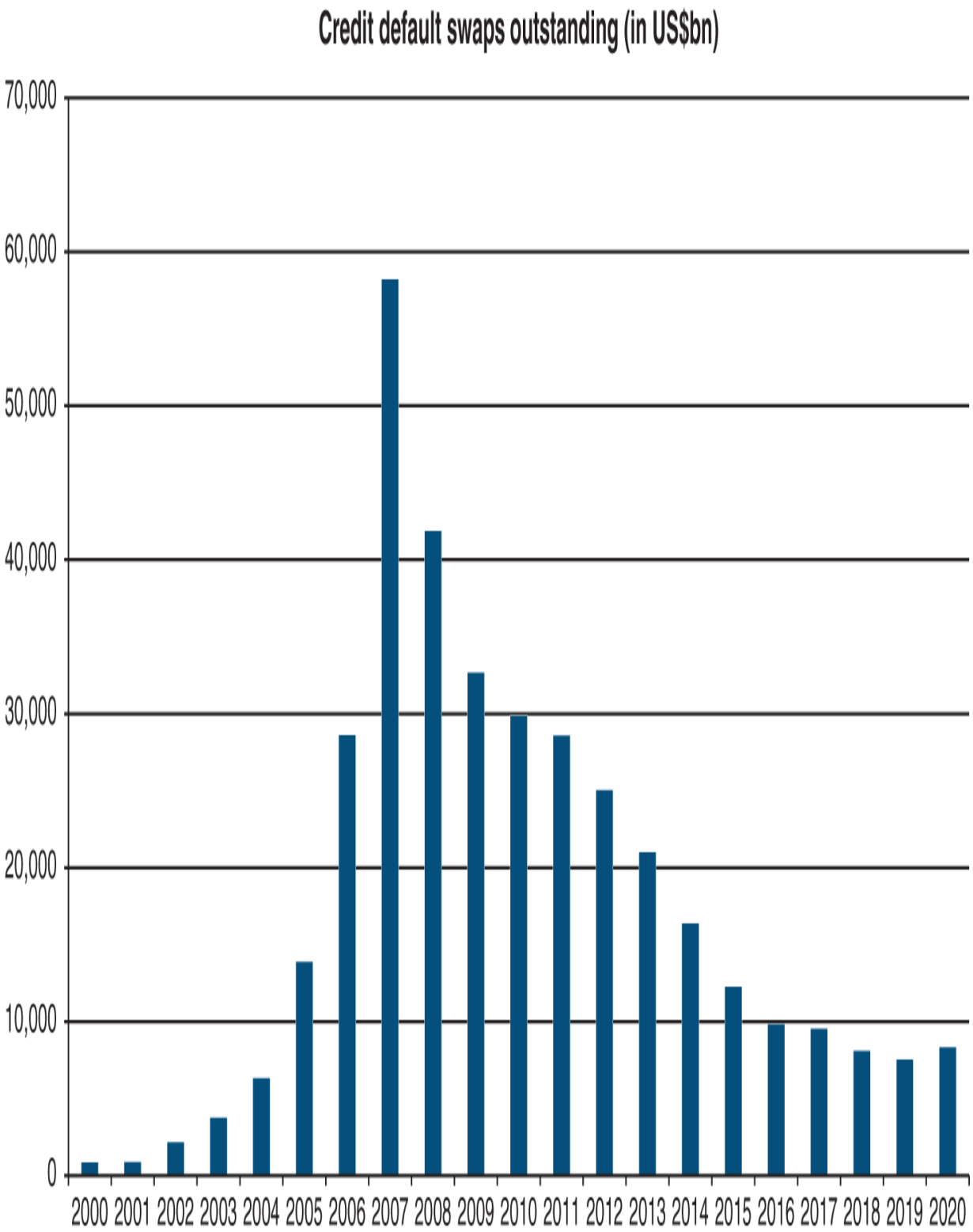
Developed and used first of all by financial institutions, credit derivatives are sometimes used by major industrial and commercial groups (less than 10% of volume) mainly to reduce the credit risk on some clients.

The most conventional form of credit derivative is the credit default swap (or CDS). In these agreements, one side buys protection against the default of its counterparty by paying a third party regularly and receiving from it the predetermined amount in the event of default. The credit risk is thus transferred from the buyer of protection (a company, an investor, a bank) to

a third party (an investor, a bank, an insurance company, etc.) in exchange for some compensation.

> Credit derivatives are traded over the counter and play the same economic role as an insurance contract.

Some regulators question the possibility of issuing this type of product if it does not effectively hedge a risk and is then pure speculation on the issuer's repayment capacity.


Credit default swaps outstanding (in US$bn)
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020

Exponential development for better hedging of an old risk…, or for better speculating as in the case of the leading US insurance company AIG, which almost resulted in its collapse in late 2008 and a crisis in the credit derivatives market which is below its 2005 level in 2020.

Source: Data from Bank for International Settlements (BIS)

(f) Political risk insurance

Political risk insurance is offered by specialised companies, such as Unistrat-Coface and SACE, which can cover 90–95% of the value of an investment for as long as 15 years in most parts of the world. Risks normally covered include expropriation, nationalisation, confiscation and changes in legislation covering foreign investments. Initially the domain of public or quasi-public organisations, political risk insurance is increasingly being offered by the private sector.

Section 51.4 ORGANISED MARKETS – OTC[9] MARKETS

1/ STANDARDISATION OF CONTRACTS

In the forward transactions we looked at in Section 51.3, two operators concluded a contract, each exposing themself to counterparty risk if the other was in default at the delivery of the currency, for example, or before the maturity of the swap. Finally, the product's liquidity was unreliable. Liquidity is closely tied to the product's specificity, and usually dependent on the willingness of the counterparty to unwind the transaction.

It is because of these drawbacks that investors turn to standardised products that can be bought and sold on an organised market, like a stock on the stock exchange. The futures and options markets have responded to this demand by offering a liquid and listed product, with a clearing house, and specialised traders who act as intermediaries and ensure that the market functions properly.

Let's take the example of a three-month Euribor traded on ICE Future Europe, which has a €1m notional value. The contract matures on the twentieth day of March, June, September and December. It is listed in the form of 100 minus three-month Euribor and can thus be compared immediately with bond prices. The initial deposit is €500 per contract and the minimum fluctuation is 0.005.

The high degree of standardisation in futures ensures fungibility of contracts and market liquidity. Liquidity is often greater on futures than on the underlying asset, as, unlike the underlying assets, futures volumes are not limited by the amount actually in issue.

Eurex, ICE Futures Europe and Chicago future markets are the main marketplaces offering contracts for managing interest rates and commodity prices.

As listed contracts have become more liquid, standardised options have emerged on these contracts, which allow financial institutions and companies to take positions on the volatility of contract prices. Organised currency risk management markets are still in their infancy, as the

dominance of banks in forward currency transactions constitutes an obstacle to the development of contracts of this type.

2/ UNWINDING OF CONTRACTS

In theory, when a contract matures, the buyer buys the agreed quantity of the underlying asset and pays the agreed price. Meanwhile, the seller of the contract receives the agreed price and delivers the agreed quantity of the underlying asset. This is the mechanism of delivery. For futures markets to be viable and to function properly, there must be at least the theoretical possibility of delivery. Possibility of physical delivery prevents the contract prices from being fully disconnected from price trends in the underlying asset. In other words, the value of the contract at maturity is equal to the value of the underlying asset at that time.

If it were otherwise, arbitrations using the physical delivery option would occur. This is quite rare because markets self-regulate. At maturity, buyers of contracts sell them to the sellers at a price that is equivalent to the price of the underlying asset at the time. The purchase of a futures contract is normally unwound by selling it. The sale of a futures contract is normally unwound by buying it back.

While upon maturity, the spot price and the future price will coincide; prior to maturity on the other hand, the difference between the spot price and the future price, known as the “base”, varies and is only rarely reduced to zero.

3/ ELIMINATING COUNTERPARTY RISKS

Derivatives markets offer considerable possibilities to investors, as long as everyone meets their commitments. The possibility of them not doing so is called counterparty risk. And such a risk, while small, does exist. For example, a contract could be so unfavourable for an operator that they might decide not to deliver the securities or funds promised, preferring to expose themself to a long legal process rather than suffer immediate losses. And even when everyone is operating in good faith, could not the bankruptcy of one operator create a domino effect, jeopardising several other commitments and considerable sums?

Unless specific measures are in place, counterparty risk should certainly be considered the main market risk. But, in fact, markets are organised to

address this concern.

Derivatives market authorities may, at any time, demand that all buyers and sellers prove they are financially able to assume the risks they have taken on (i.e. they can bear the losses already incurred and even those that are possible the next day). They do so through the mechanism of the**clearing, deposits and margin calls**. The clearing house is, in fact, the sole counterparty of all market operators since the first one appeared in Le Havre in 1882.

The buyer is not buying from the seller, but from the clearing house. The seller is not selling to the buyer, but to the clearing house. All operators are dealing with an organisation whose financial weight, reputation and functioning rules guarantee that all contracts will be honoured.

Clearing authorities demand a deposit on the day that a contract is concluded. This deposit normally covers two days of maximum loss.

Daily price movements create potential losses and gains relative to the transaction price. Each day, the clearing house credits or debits the account of each operator for this potential gain or loss.

When it is a loss, the clearing house makes a **margin call** – i.e. it demands an additional payment from the operator. Hence, the operator's account is always in the black at least by the amount of the initial deposit. If the operator does not meet a margin call, the clearing house closes out its position and uses the deposit to cover the loss.

For potential gains, the clearing house pays out a margin.

When the contract has exceeded the clearing house's maximum regulatory amount, price quotation is stopped and the clearing house makes further margin calls before quotation resumes.

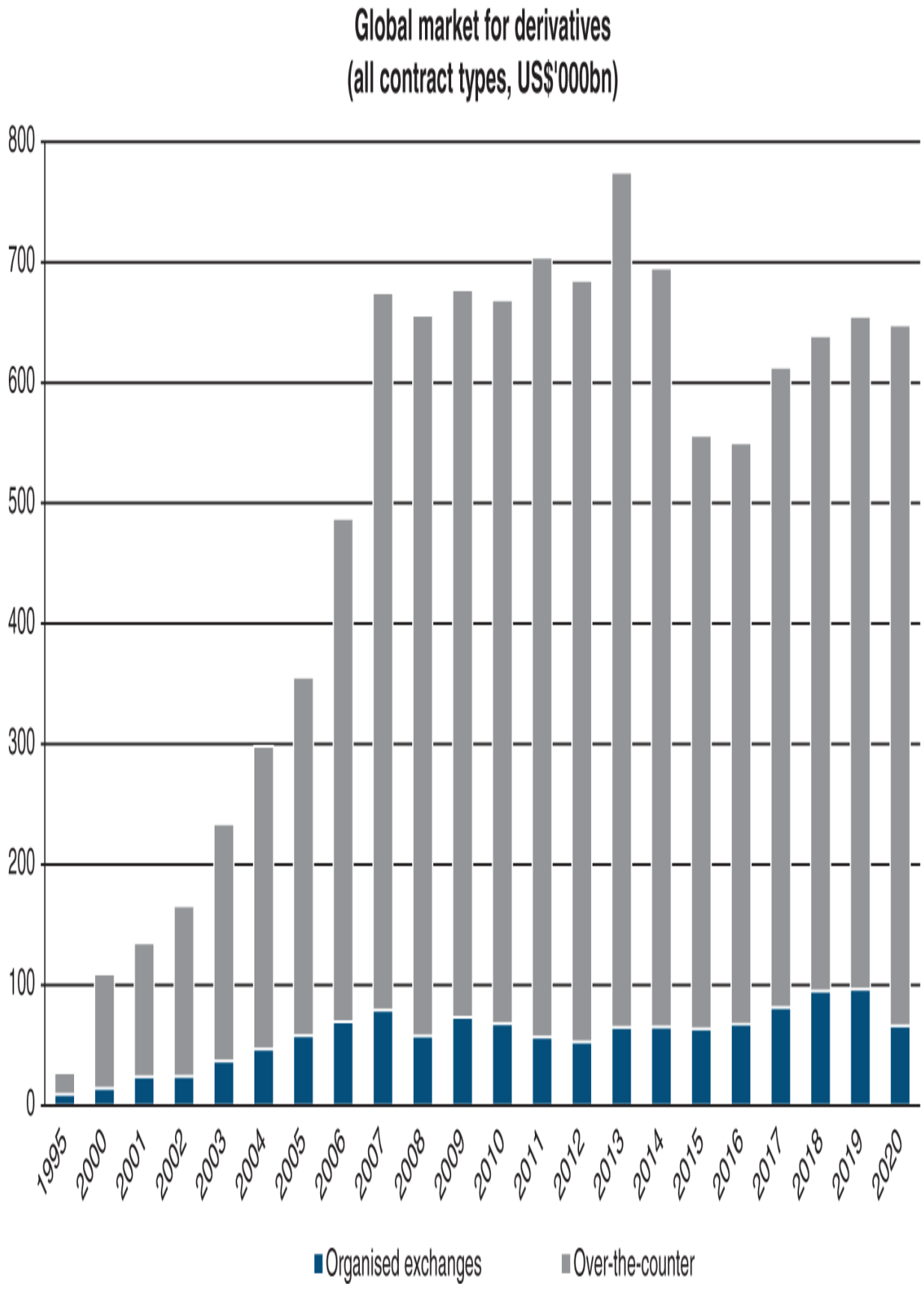
It should be noted that OTC hedging contracts generally fit into a relatively standardised framework agreement (similar to models proposed by ISDA[10]). These framework agreements often provide for margin calls as in organised markets.

4/ IMPORTANT LEVERAGE EFFECT

Margin calls are an integral component of derivatives markets. By limiting the amount of the initial deposit, margins provide considerable leverage to investors. Let's take the example of cocoa futures contracts and let's assume a guarantee deposit of £75. On 21 March, we buy a July cocoa contract for £1,887/tonne. In July, cocoa is quoted at maturity at £2,000/tonne on the spot market. We used futures contracts to procure July cocoa for £1,887/tonne, hence a £113 gain for a very limited outlay (just the deposit of £75). The return is considerable: 113 / 75 = 151%, whereas cocoa has gone up just (2,000 – 1,887) / 1,887 = 6%. **Here is an example of the steep leverage of futures, but leverage can also work in reverse.**

Such steep leverage explains why counterparty risk is never totally eliminated, despite precautions that are normally quite effective. Margin calls limit the extent of potential defaults to the losses that are incurred in one day, while the initial deposit is meant to cover unexpected events.

This leverage effect is not typical of organised derivative markets, it is typical of derivative products. The mechanics of a clearing house do not make it possible to eliminate this leverage but they ensure that at any point in time, each market player can meet the consequence of its positions. This theoretically avoids a chain reaction in case of bankruptcy.


Global market for derivatives
(all contract types, US$'000bn)
800
700
600
500
400
300
200
100
0
1995
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
Organised exchanges
Over-the-counter

OTC markets are much larger than organised markets due to interest swaps, as a consequence of the 2008 financial crisis.

Source: Data from Bank for International Settlements (BIS)

Companies are required to file declarations for hedging transactions using over-the-counter or market instruments (European Market Infrastructure Regulation – EMIR).

5/ A ZERO-SUM GAME

Futures are a zero-sum game, as what one operator earns, another loses. The aggregate of market operators gets neither richer nor poorer (when excluding intermediation fees).

Let's take the above example of a tonne of cocoa quoted at £2,000 at the end of July. We saw that the person who bought contracts on 21 March has earned £113 per tonne. On the other side, the operator who sold those contracts on 21 March must deliver cocoa at the end of July for £1,887, even though it is priced at £2,000. They will thus lose £113, the exact amount that their counterparty has earned.

> A zero-sum game, not a senseless game.

This is not only a zero-sum game but also a worthwhile game. Derivatives markets are there not to create wealth, but to spread risk and to improve the liquidity of the financial markets. On the whole, there is no wealth creation.

SUMMARY

The summary of this chapter can be downloaded from www.vernimmen.com.

Managing risk inside a company has become a hot issue: regulations are much stricter, and there is strong pressure from investors for more transparency and greater awareness by top management.

Risk management requires identification of risks, setting up controls, measuring the residual risk and lastly choosing a hedging strategy.

Risk is characterised by frequency and intensity.

We can identify five major risks:

market risk – i.e. exposure of the company to unfavourable changes in interest and exchange rates or prices of raw materials or shares;

counterparty risk – i.e. the loss of repayments of a debt in the event of default of the creditor;

liquidity risk – i.e. the inability of a company to make its payments by their due date;

operating risk – i.e. the losses caused by errors on the part of employees, systems and processes;

political risk – i.e. the impacts on importers, exporters and companies that invest abroad.

Market risks are measured with the notion of position and value at risk (VaR). Liquidity is measured by comparing debt repayment and expected cash receipts. Techniques for measuring other risks are still in their infancy.

When confronted with risk, a company can:

decide to do nothing and take its own hedging measures. This will only apply to small risks or some very large corporates;

lock in prices or rates for a future transaction by means of forwardation;

insure against the risk by paying a premium to a third party, which will then assume the risk if it materialises. This can take the form of an option;

immediately dispose of the risky asset or liability (securitisation, defeasance, factoring, etc.).

The same types of product (forward buying, put options, swaps, etc.) have been developed to cover the five different risks and are traded either on the over-the-counter (OTC) markets or on stock exchanges. On the OTC market, the company can find products that are perfectly suited to its needs, but there is the counterparty risk of the third party that provides the hedging. This problem is eliminated on the futures and options markets, although the price paid is reduced flexibility in tailoring products to companies' needs.

QUESTIONS

1/What are the five financial risks that companies are exposed to?

2/Describe five ways for a company to deal with risk.

3/You plan to use arbitrage to calculate forward selling of yen against euros at three months. What information do you need to do the calculation?

4/What is an FRA?

5/What is a future?

6/A Portuguese company imports maize from Mexico, which it in turn exports to Canada. The company pays and is paid at three months (the maize is, in fact, shipped direct from Mexico to Canada). Should it buy or sell a peso call option or a put option against the Canadian dollar?

7/What are the differences between OTC forward transactions and futures?

8/What role does a clearing house play?

9/Can credit derivatives be based on options?

10/Does a derivative product have to be sufficiently liquid to be attractive?

11/Can you provide examples of hedging products used by individuals?

12/What category of derivative products would personal injury insurance fit into?

13/Should corporate treasurers take advantage of any arbitrages that they detect on the markets?

14/Should traders take advantage of any arbitrages that they detect on the markets?

15/Excluding any costs, can a company hedge against all of its risks, taking the risk of opportunity into account? And the trader?

16/A company is hedging more than its actual position. In doing so what is it actually doing?

You'll find more questions at www.vernimmen.com.

EXERCISES

1/Calculate the future buy and sell price at three months (dollar against euro) using the following information:

the three-month euro rate is equal to –⅞%;

the three-month dollar rate is equal to 3⅞ – 4%;

the euro is currently trading at $1.0210 / 20.

2/Calculate the six-month interest rate of the dollar on the basis of the following information:

the six-month euro rate is equal to – ⅝%;

the euro is currently trading at $1.0210 / 20;

the euro is trading at six months at $1.0150 / 60.

3/A market trader is offering a $500m loan agreement in three months, for a period of three months, on the following terms: 3¾ – 3⅞%. Using the information provided in Exercises 1 and 2, can you identify an arbitrage opportunity? What is the potential gain for the arbitrageur?

4/Is an arbitrage of this sort really without risk?

5/If a corporate treasurer finds themself in the situation described above, should they execute the arbitrage?

ANSWERS

Questions

1/*Market, liquidity, political, operational and counterparty risk.*

2/*Avoidance, self-hedging, locking in prices or interest rates now, taking out insurance, disposing of the risky asset or liability.*

3/*See Section 51.3, 3/(a). Three-month yen borrowing rate. Three-month euro investment rate. Yen/euro spot price.*

4/*See Section 51.3, 3/(b).*

5/*A forward purchase or sale contract traded on an exchange where the counterparty risk is eliminated by the clearing house but the contracts are not tailor-made.*

6/*Purchase of a call option on pesos because its risk is that of a rise in the peso.*

7/*Futures are traded on an organised market that eliminates counterparty risk and offers standardised contracts that are more or less adapted to the needs of the company. OTC contracts have opposite advantages and disadvantages.*

8/*Eliminating counterparty risk thanks to deposits and margin calls.*

9/*Yes there is no limit to imagination.*

10/*No – it may be an OTC product, like most of them.*

11/*All insurance policies.*

12/*A floor, which guarantees you a minimum price just as insurance restores the value of a property that would have been lost due to an accident.*

13/*No, there is no such thing as a perfect arbitrage, and there is often an element of speculation. Accordingly, it does not fall within the remit of a corporate treasurer.*

14/*Yes, of course – that's what traders do.*

15/*No, because it cannot wind up its business. Yes, because they can wind up their commitments.*

16/*It is speculating.*

Exercises

A detailed Excel version of the solutions is available at www.vernimmen.com.

1/*Three-month forward euro exchange rate: $1.0185 – $1.0201.*

2/*Six-month dollar interest rate: 3.099% – 3.623%.*

3/*You should borrow $495.2m at six months at 3.623%, invest it at 3⅞% in dollars for three months (you will then have $500m in three months) and buy the traders' contract. The value of the arbitrage gain is $514,380 to be cashed in with no risk at maturity of the contract.*

4/*No, there is always the counterparty risk of the trader offering the contract.*

5/*No, because there is no way of measuring counterparty risk or any of the other market inefficiencies. For the corporate treasurer, this transaction would amount to financial speculation and, accordingly, would not form part of the ordinary course of the company's business.*

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NOTES

1 *Excluding market products such as cat bonds, where the coupon or redemption price is drastically cut in the event of an occurrence of a disaster suffered by the issuer.*

2 *See Chapter 18.*

3 *That is, the use of an average exchange rate for the P&L and the closing rate for the balance sheet.*

4 *The reinsurance market allows insurers to transfer part of their risks to other insurance companies, called reinsurance companies, which act as insurers for insurers.*

5 *If the swap exists as a hedge for an existing debt (or asset).*

6 *Secured Overnight Financing Rate that will soon replace the USD Libor; Euro Interbank Offered Rate.*

7 *Also called Asian options.*

8 *Products allowing the buildup over a period of time of a hedge at attractive rates… if market conditions are favourable.*

9 *Over the counter.*

10 *International Swap and Derivatives Association.*

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Chapter 52
MANAGING OPERATIONAL REAL ESTATE

Fifty shades of rent

Methods for managing operational real estate differ from group to group. Some prefer to remain the king of the castle and own their operational real estate, while others consider these blocked assets as frozen cash that could be better used in developing the group's core business more rapidly. Even within a given sector, strategies differ from one player to another, over time, or within the same group.

There are, however, three facts that are clear: managing operational real estate is a real issue, which has become increasingly sophisticated under the influence of private equity firms and real-estate professionals. Often within the company, the different departments all have their own opinion on real estate – the finance department of course, but also legal, human resources and operations. An internal real-estate department or an external advisor is often necessary for consolidating all of the views of all of these departments and providing general management with rational proposals that are solely in the interest of the company.

The problem of managing real estate is certainly more acute in sectors where real estate plays a key role (the hotel, retail, restaurant, health and leisure sectors) than in others, but it impacts on all companies, even if only in terms of their headquarters.

Finally, this chapter does not concern real-estate assets which have a very specific purpose, such as a nuclear power plant or a petrochemical factory, the redeployment of which would be prohibitively expensive to carry out.

Section 52.1 METHODS FOR FINANCING REAL ESTATE

1/ REAL ESTATE FINANCED USING EQUITY CAPITAL

Real-estate assets have the advantage, as a general rule, of maintaining a high value that is unrelated to the operational process and that is relatively not very volatile. Accordingly, they are, in theory, attractive and can be used to back financing through borrowing. Even if real estate is financed using equity capital without it explicitly constituting a guarantee for lenders in one way or another, it is still a source of comfort for the group's bankers. It is also important to bear in mind that raising debt backed by real estate may seem like the easy option, but it could handicap the company at a later stage when it is seeking to raise ordinary debts, since the lenders will know that the real estate has already been pledged to third parties.

Financing real estate using equity capital means keeping room for manoeuvre in the future (with the possibility in the future of selling it, renting it, or by offering it as collateral) and providing comfort to shareholders and lenders, but also suppliers, customers and staff vis-à-vis the solvency and thus the long-term success of the company.

2/ REAL ESTATE AS BACKING FOR STANDARD LOANS

A mortgage, i.e. a pledge of a real-estate asset to a lender, is the most direct way of backing a debt with a real-estate asset. What happens in such cases is that the proceeds of the sale of the asset are used to reimburse the creditor directly. Nevertheless, in countries where it is a cumbersome and expensive process, this type of financing is generally only used by very small and small to medium-sized companies, which do not necessarily have access to other forms of financing. With a mortgage loan it is possible to easily raise up to 50% of the value of the asset (the loan to value ratio is called “loan to value”, LTV). In Anglo-American countries, mortgage loans on commercial assets are more common and the loan to value ratio can be up to 70%.

In some countries, a trust is a more secure way for the lender to finance real estate. The real estate assets are placed in a trust of which the bank is the trustee. This does not result in a transfer of ownership (i.e. no capital gain and hence no tax cost).

But there are other less formal ways of securing a loan with real estate. These assets may be covered, under a loan agreement (or a bond), by a so-called

negative pledge which prevents the company from using its real estate as a guarantee to other lenders, or selling it. Additionally, banking covenants (see Section 39.2) may oblige the company to keep a minimum amount of real estate on its balance sheet. Such covenants are significantly more flexible than taking out a direct guarantee on a property, as they enable the company to carry out arbitrage on its real-estate assets.

Finally, securitisation of real-estate assets (see Section 21.3) is only an option for real-estate groups or for very large industrial groups which own a lot of real estate. Label'Vie, a Carrefour franchisee in Morocco, securitised some of its shops in 2020 for €40m, after an initial operation in 2013 for €45m.

3/ FINANCE LEASE

A finance lease is a common tool used for financing real-estate assets over a long period (up to 15–20 years). For a company, this means having a real-estate asset acquired by a specialised financial institution (which must either be a bank or a financial firm) and then leasing it (see Section 21.3). At the end of the finance leasing agreement, the company can either acquire the asset for a small or symbolic amount, or leave it to the financial lessor or possibly continue to lease it (at a reduced rent as it no longer covers the amortisation of the asset). The financial lessor remains the owner of the asset for the duration of the agreement, which ensures its liquidity in the event of the company defaulting, since it can re-let it to a third party if there is no secondary market for the real-estate asset, which would be too specific.

Property leasing generally covers 80% of the value of an asset, which is more than for a standard loan and at a lower interest rate. Additionally, financial lessors are often prepared to finance more than 90% of the value of necessary renovations.

In most countries, property finance leasing presents a marginal tax advantage as the rent reflects an accelerated amortisation of the property. Even if this surplus amortisation must be taken up when the option is lifted, the company would have benefited from postponement of the tax paid.

4/ OPERATING LEASE

For ordinary rental, the company only makes a commitment for the duration of the operating lease. This may vary widely depending on the aims of the company and the lessor, but also in line with the type of property and the country.

Rents can be indexed according to activity either to a commercial rents index or consumer prices, new construction price changes in retail sales or the change in GDP, or any other index the parties agree upon. Indexing rents to an independent index of the company's economic activity results in the risk of a negative scissors effect over which the company has no control. So some groups have opted for rents that are totally or partially indexed to the activity of the site exploited (e.g. rent indexed to turnover). Some groups have even succeeded in forcing the property owner to agree to a rent cap in line with earnings of the activity exploited.

We refer to the capitalisation rate to designate rent divided by the value of the asset.

5/ SALE AND LEASEBACK

Sale and leaseback is an implementation method and not a type of financing as such. This operation enables a company to change from an equity capital financing to a rental. Some use the term leaseback to refer to the sale of a real-estate asset and its subsequent rental with an option to buy (usually though a finance lease), others do not draw a distinction and refer to a sale and leaseback whether there is an option to buy (finance lease) or not (operating lease).

The sale and leaseback system enables the company to free up cash and also to unlock the market value of the real estate with the pros (strengthen equity capital in the event of capital gains) and cons (possible tax to be paid on capital gains) that this brings.

Section 52.2 CRITERIA FOR CHOOSING REAL-ESTATE FINANCING

1/ MATURITY OF THE COMPANY

A young company, in its high-growth phase, will need large amounts of cash to develop its activity. Additionally, as its perimeter (and sometimes even its economic model) is not yet fixed, its real-estate requirements will vary sharply over time. In such cases, an operating lease seems to be the most suitable choice in order to provide maximum flexibility while not depleting supplies of cash, a resource that is very precious at this stage. There's no point in buying premises only to find that they're too small in a few quarters' time. When choosing a lease, don't be swayed by the immediate advantages that may go with a longer lease (no rent for several months, reduced charges) instead of a shorter lease, and then a few years later find yourself stuck with a building but not enough business to justify it.

On the other hand, a company that has reached maturity could seriously consider investing in its real estate. In particular, it could secure its strategic operating assets by owning them outright. This is how Chanel acquired in 2020 (for £310m) the building on Bond Street which houses its London shop on 12,600 square feet, paying £70m more than the price initially required as there were many buyers. Owning a large chunk of real estate could also be a form of saving for a rainy day in the case of a major investment opportunity or financial difficulty linked to an economic downturn.

Midway between these two cases is the company that has reached maturity on its market and which externalises its operating real estate in order to finance growth on new markets. Once the commercial concept has taken hold on these new markets, the company then again has the option of externalising the financing of its operating real estate.

2/ SHAREHOLDERS

The role of shareholders is especially important in terms of a company's real-estate policy when such companies are family owned, for both psychological and asset-related reasons.

Very often, a family will be attached to a building or a geographical area where the company took off or which marks a very important step in the company's life. There may be reasons that are not at all rational why it may be reluctant to sell its

property. For example, take the Publicis building at the top of the Champs-Elysées, which was destroyed by fire in 1972 and rebuilt.

It is, moreover, frequent to see a family-owned holding company or a family-owned real-estate investment firm holding all or part of the operating real estate that it rents to the company and that it finances using debt that is repaid with the rent received. This arrangement enables an entrepreneur who is approaching retirement age, and who wishes to secure their revenues, to be more exposed to real estate than to the operating activity. They just need to increase the size of their stake in the real-estate company and gradually dilute their stake in the operating company. In time, real estate that is personally owned can then be sold to the company, thus constituting a larger retirement capital, all the more so when capital gains tax on real estate is regressive and falls to zero after a certain number of years of ownership.

In the same vein, the head of a family-owned company who has several children could leave the operational activity to the child who is best suited to carrying on the business and leave the real estate (and any other non-strategic assets) to the other children. This sort of arrangement will prevent the company from getting bogged down in fratricidal wars or incompetent siblings being left in top management positions.

Real estate can also be considered as a reserve of value and liquidity in the event of a major issue, and as a stabiliser of the company's value, following the example of the CMA CGM tower in Marseille for the eponymous group.

3/ OPERATIONAL CONSTRAINTS AND OPPORTUNITIES

A company's real-estate assets do not all serve the same purpose and they can be classified into several categories:

very specific assets, the location of which is key, e.g. the Harrods building on Knightsbridge or the Saks Building on 5th Avenue;

ordinary real-estate assets which, if the company moved location, would not result in a significant impact. Office blocks fall into this category;

non-strategic operating assets or assets of which the long-term usefulness is not apparent.

The first category of real-estate assets has a value for the company over and above the turnover generated, which is the brand value, the value of its image. Additionally, the company often wishes to retain the freedom to restructure the building, to choose its neighbours (co-operators), etc. Only full ownership and

possibly capital leasing (which is deferred full ownership) allows it to guarantee this flexibility. Moreover, a decision by the landlord not to renew an operating lease cannot be excluded, which is why ownership is often preferred for this kind of asset.

Some real-estate groups that have acquired ownership of buildings are now seeking to take back the business and/or the operation. The reason for this is simple. In many sectors, a building only has value as a result of the rent that the tenant can pay. If the tenant improves its income statement substantially as a result of its commercial actions, management and renovation work, it will be able to pay higher variable rent to the owner.

For ordinary buildings, operational flexibility is of little interest and the group can generally neglect operational issues in the choice of a holding system. In this case, the choice between ownership and a rental method is purely a financial arbitrage.

For non-strategic assets or assets that the group does not intend to hold long term, maximum flexibility is achieved by renting. This enables the group to decide more easily between locations and increases the number of potential buyers if the activity is sold (because the selling price is reduced). A game then sets in between the seller, who remains in the building as a tenant, and the buyer, which revolves around the length of the lease and the probability that the tenant will renew the lease or not. The new owner of the property will lose out if the tenant ends up staying for a shorter term than expected, because it will then incur costs for finding a new tenant, for upgrading the building and in lost rent.

For example, Peugeot sold its Paris headquarters in 2012 to help it cope with a serious crisis and opted for a location in Rueil-Malmaison. This gave it the flexibility in June 2020 to leave it and spread its employees over existing industrial sites… and work from home 80% of the time to reduce its office space by 30%. This move would undoubtedly have been much more difficult with a head office that was still in full ownership, quite old, and unsaleable in the middle of a lockdown!

4/ TAXATION

Of course, taxation has to be factored in – capital gains tax in the case of a sale and leaseback, during the exploitation of the asset (deductibility or real-estate charges) and the eventual sale of the asset (capital gains tax).

The revaluation of a relatively old building when it is sold generally results in capital gains taxable at the normal corporation tax rate for the company selling

the asset, but makes it possible to create (for the acquirer) a tax base linked to the future amortisation of the asset. Taxation will generally be negligible for a newly constructed building that is sold.

Capital gains tax is a major issue in a sale to a third party and could create an obstacle for an internal restructuring without generating any cash with which to pay this tax. However, for a company that has tax losses carried forward, capital tax can then be reduced (or sometimes eliminated altogether) and will balance out with the present value of the future tax saving due to the tax base created by the revaluation of the carrying price of the real-estate asset.

It is worth noting that many countries have a special type of real-estate company that provides tax transparency. So we get REITs (real estate investment trusts) in the US and the UK, SIIQs in Italy and sociétés d'investissements immobiliers cotées (SIIC) in France. The benefits of this regime are subject (most of the time) to certain constraints in terms of payouts (most rents received and most capital gains made must be paid out as dividends) and in terms of shareholding (a single shareholder may not hold more than a certain percentage of the share capital).

5/ FINANCIAL CONSTRAINTS

When a company's financial situation is strained, the sale (temporary or permanent) of its real estate may be a solution that can be implemented quickly. It's a bit like having a nest egg. An example is the supermarket Casino, which in 2018–2019 sold €1.5bn of commercial real estate. If the assets are very specific operational real-estate assets, with no secondary market, the investor will require a long-term commitment from the company to stay on as a long-term tenant.

This operation is the “liquefying” of one of the company's assets, i.e. the exchange of a promise of future flows (rent) for an amount of cash (the sale price of the property). Here, the real estate becomes a simple financial product. In such cases, the owner is generally a financial investor taking on the possible non-exploitation of the underlying site as its main risk. If the site is a sufficiently key element of the company's industrial set-up, then this risk is limited. Often, the management of the building will remain mostly the responsibility of the operating tenant, which will also cover the cost of maintaining the site (triple net rent).

6/ FINANCIAL CRITERIA

For a purely financial manager, owning real estate (or another asset) means considering that unless one is the owner thereof, it's a good idea to buy it. This implies thinking that buying this asset will create value for the company, either

because it was bought at a lower price than its market value or because it enables the company to reduce its risk.

The assumption that an acquisition price is lower than the market price (or that a sale price is higher than the market price) implies that the real-estate market is inefficient at a given time. Deciding to sell a property when real-estate prices are high, or to take advantage of a buoyant market to sell real-estate assets, is, if one believes in the theory of efficient markets, simply speculating on the evolution of real-estate prices, which means taking a risk.

Although the acquisition of real estate usually enables the company to reduce its risk, this is not a good enough reason in itself to acquire property. This reduction in risk is only followed by an increase in value if returns decline at a slower pace than the risk. But let's not deceive ourselves, if real estate is less risky than the company's capital employed, it will also be less profitable. Here, this ends up being just a type of diversification for the company. And we saw in Section 26.2 that diversification only reduces the specific risk, which is a non-remunerated risk, and that financial synergies do not exist. So most often, it's naïve to believe that value can be created in this way.

A first step in deciding whether a company should own its real estate or not could be to compare the cash flows of the different options. At the end of this chapter there is an exercise involving such a simulation.

This comparison will require you to determine a discount rate which must differ in line with the methods for owning the property. Since it is often difficult to put an exact figure on the impact of difference in risk on the required rates of return in each situation, we often see people using the same discount rate. Do not be deceived – this is financial heresy.

The problem is often turned the other way round by looking at the difference in yield to maturity between renting and a loan or between a bank loan and real-estate leasing, in order to make a choice.

In the 2000s, capitalisation rates were lower than the interest rates on loans of some groups, encouraging them to sell their real estate. Today, the situation is generally the other way round in Western Europe: we see capitalisation rates of 2.7% to 5.5% compared with interest rates of 1% to 2%.

Accordingly, it is better now to buy real estate (and borrow at 1–2%) rather than to externalise real estate (and pay rent at 3–6%), which explains why today, externalisation operations have become increasingly rare. Unless, of course, you believe that there will be a substantial drop in the value of real estate in the future or you bear very high interest rates due to your financial situation.

All in all, in terms of real estate, the financial director would be well advised to be pragmatic and not to forget that good real-estate decisions cannot be taken in a hurry. Anticipation is the key to success, whether for renegotiating leases, looking for new premises or selling a property. A period of 18–24 months is often needed to pave the way for a change in real-estate strategy. This is a very important point, which financial directors do not always anticipate.

Section 52.3 VALUE CREATION AND INVESTOR PERCEPTION

The impact of sale and leasebacks on enterprise value has been considered thoroughly in the academic literature. Grönlund *et al*. (2008) found that sale and leaseback operations carried out between 1998 and 2003 created value. The results of this study converge with other similar studies, carried out in the UK and the US.

Other more recent studies seem to mitigate these results. The perception of value creation may change over time and, over the long term, rental-related constraints may destroy value, something that would not initially have been obvious, either to the company or to its shareholders.

A financial director considering the impact of externalising their real estate assets will compare the value of the shareholders' equity with its real estate on the one hand, to the value of the externalised real estate plus the value of the shareholders' equity without the operating real estate on the other hand. The latter can be rigorously assessed either by the multiples method, with a few precautions, or by a variant of the discounted free cash flow method (Opco/Propco method).

Via the multiples method, three approaches are possible:

use an EBITDA multiple (now that the application of IFRS 16 requires the restatement of operating rents[1]);

restrict the sample of comparable companies to those with a similar real estate policy, i.e. those that rent out their operating property;

or, in the multiple of companies that own their own real estate, to reverse the impact of this situation on the multiple by using the following formula:

$$\text{Full multiple} = \text{Multiple without real estate} \times \frac{\text{Non-real-estate EBIT}}{\text{Total EBIT}} + \frac{\text{Real-estate EBIT}}{\text{Total EBIT}} \times \text{Real-estate multiple}$$

But if markets are not efficient and do not integrate this way of reasoning, the externalisation of real estate could mechanically create value. In fact, the property is valued on the basis of high multiples that reflect a very low risk (and currently very low interest rates).

AVERAGE EBITDA MULTIPLES OF LISTED REAL-ESTATE COMPANIES IN EUROPE

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021e	2022e
EBITDA multiple	19.5	20.3	22.2	23.8	28.0	25.5	25.5	25.4	27.4	29.5	27.6	25.3

Source: Exane BNP Paribas

The creation of value linked to the externalisation of real estate should be visible if groups owning their own real estate are valued on the basis of the same EBITDA multiples as those which are renting theirs.

The Opco/Propco method is a discounted free cash flow method adapted to take into account the significant real estate component of a group. The group is then valued as the sum of an operating company (Opco) and a company owning the operating property (Propco) that it leases to the operating branch. The former is valued by discounting its free cash flows, from which the rents (net of corporate income tax) paid to the Propco have been deducted. The latter is valued on the basis of the market value of the operating property (capitalisation of the rent or price per square metre).

From a practical point of view, the appraiser will be sure to discount the free cash flows, after deducting property, rent at a higher discount rate than that observed for a company that owns its operating property. This is because rents are a fixed cash cost (they must be paid whether in real life or as a hypothesis for a calculation!) and therefore raise the breakeven point.

The generalisation of valuations as Opco/Propco[2] for companies with a large amount of real estate shows that investors are not usually village idiots and that they do take the real-estate part into account in the overall multiple that they attribute to a group!

Section 52.4 AN IDEAL WAY OF ORGANISING REAL ESTATE?

A large number of groups that own operating real estate have understood that this situation could lead to a major drawback, i.e. the fact that operational managers consider real estate as being cost-free or virtually cost-free, because, since depreciation and amortisation is a non-cash cost, it is often considered to be conventional and insignificant.

In order to get around this problem, the group could set up an internal structure with a property subsidiary (Propco, which owns the real-estate assets) and an operational subsidiary (Opco, which rents and operates this real estate). This structure means that operational units are required to pay a rent, which is a way of making operational managers aware of the cost of capital and puts an end to the incorrect perception that real estate that is owned is cost-free.

As an illustration, a few years ago, Galeries Lafayette in the centre of Metz, France, owned and occupied the whole of a building, on the principle that, when real estate is “free”, the store should occupy the whole building. Then, a market-rate rent started to be invoiced to this store, which resulted in operating losses. After some protests, the store managers had to admit that this method of invoicing rent, although new, was not unreasonable because the other group stores, in other regional towns, had third-party landlords. As the loss-making situation could not continue in the long run, the store managers gave serious thought to the nature of the product offering that they provided to their customers, given customer requirements and the competitive situation. They came to the conclusion that they could return to the group one-quarter of the floor space they occupied and still have a relevant offer, while being better placed to respond to competitors on the outskirts of the town. This extra floor space was let by the group to a third-party retailer with a complementary product offer which, combined with the renovation work financed from the rent received, enabled the high-street store to inject new energy into their commercial offer and make it profitable again.

More generally, the setting up of a subsidiary dedicated to real estate means that the group could get professionals in the field to manage the group's real estate synergistically, because real-estate management is a separate job in itself (asset arbitrage, monitoring of works, real-estate taxation, service providers, etc.).

Using real estate to extend the maturity of debt is made much easier if all of the assets are held within a single vehicle. Finally, if in time the group wishes to sell

all or part of its property, internal property can be sold or its capital opened up to third parties.

There are some constraints that limit the setting up of a Propco within a group (mainly, a high latent tax on capital gains could discourage sales between the group's companies). In a large group, with an elaborate management control system, different reporting units can be structured within the same company to allow analytical accounting to show the presence of an Opco and a Propco virtually, even if such entities do not exist legally.

For a group that owns its real estate and does not publish its financial statements according to this breakdown, external analysts can try to recreate these two components virtually in order to better compare performances with sector peers or to value them in a homogeneous manner.

SUMMARY

The summary of this chapter can be downloaded from www.vernimmen.com.

A company's real-estate assets can be owned outright and financed using equity capital (i.e. without using them explicitly as backing for a financing), used as backing for a specific financing (mortgage, sale and leaseback) or rented using an ordinary lease. Raising financing backed by real estate can handicap a company in the future if it wished to raise ordinary debt, as the lenders will know that the real estate is already pledged to third parties. Financing real estate using equity capital means keeping room for manoeuvre in the future (with the possibility of selling it or renting it) and providing comfort to shareholders, lenders, suppliers, customers and staff. A sale and leaseback can be used to move from ownership to lease (operating or finance).

The optimal financing method will depend on the nature of the asset (strategic, ordinary or not long term for the group), on the maturity of the group (more rental for a young group and more ownership for a group that has reached maturity), on the desires and constraints of shareholders (in particular when shareholders are family members), on taxation (capital gains) and on the financial constraints with which the group is confronted.

Groups in the same sector with different methods of holding their property will present different growth and risk profiles, which justify valuation multiples that are also different. Investors will take this aspect into account, either by reasoning in terms of EBITDA multiple (i.e. before rent under IFRS standards) or by valuing the operational activity separately from the real-estate activity (Opco/Propco).

The distinction within the company of flows relating to real estate (rent) and flows relating to the operating activity means that the managers of the different sites can be forced to comply with a healthy constraint and thus optimise management. This distinction can be concretised by setting up a real-estate subsidiary that is managed separately or a virtual subsidiary using analytical accounting.

All in all, when it comes to real estate, the financial director must first and foremost be pragmatic.

QUESTIONS

1/In absolute terms, what is the ideal method for holding real estate?

2/A banker is trying to convince you to use your group's real-estate assets as backing for a loan in order to bring down your cost of financing. How do you respond?

3/You notice that the EBITDA multiples of the Houses for the Retired Inc. are 8× while they are 10× for the Kentucky Retired Homes. How do you explain this in the light of this chapter?

4/Will a family-owned group be more inclined to own more or less real estate than a group owned by financial investors? Why?

5/Why is taxation a determining factor in managing a company's real estate?

You'll find more questions at www.vernimmen.com.

EXERCISE

1/The Multiplax group, the European leader in cinema theatres, is considering an investment in a 15-theatre complex in Dover. The investment would amount to £3.7m for the land and £15m for the building and equipment, to be amortised over 15 years. Multiplax is considering either buying or renting the real estate. The group expects its business to expand as follows:

In thousands of euros	**N**	***N* + 1**	***N* + 2**	***N* + 3**	***N* + 4**	***N* +5**	***N* + 6**
Sales	—	3,429	5,988	6,800	7,088	7,390	7,635
Cost of goods sold	—	(1,484)	(2,551)	(2,912)	(3,047)	(3,190)	(3,301)
Personnel expense	—	(667)	(887)	(913)	(941)	(969)	(988)
Other operating charges (excl. rent and depreciation and amortisation)	—	(212)	(51)	(169)	(176)	(181)	(197)

Theoretically, for this type of activity, working capital is negative (customers pay cash and the company has practically no inventories), but the careful management has made its projections on the assumption of zero working capital over the whole of the business-plan period.

Given the uncertainties hanging over this project, the group has also taken a terminal value of zero after 20 years (excluding the book value of the land if the group is the owner thereof). On the other hand, the group has not planned to invest in maintenance of the building.

If the group buys the real estate, it intends to finance it through a 10-year bullet loan at 2.5%.

Alternatively, Multiplax could rent the same building from a third party at an annual rent of €1,350m.

Simulate the income statement, balance sheet and cash flow statement for Multiplex according to both methods for holding the real estate (assume a corporation tax rate of 25% and interest on cash at 0%).

Do you think the amount of debt that Multiplax wishes to take out is tenable?

Calculate the NPV on both investments with a cost of capital of 7%.

Is using the same cost of capital justified? At what cost of capital is the NPV of the project with rental equal to the NPV of the project with a purchase of the real estate?

ANSWERS

Questions

1/*There is no ideal method for holding real estate and it depends on the company's parameters (investment opportunities, financial situation) and on those of the target property (strategic for the company or not, in need of renovation, etc.).*

2/*In general this is false, because even if the interest rate obtained on the real-estate financing looks attractive, it would be to the detriment of other financings for which the cost would be consequently higher, as the lenders would then not benefit from the security provided by the real estate.*

3/*It is possible that the Houses for the Retired Inc. rents its real-estate assets and that Kentucky Retired Homes owns its real-estate assets. Accordingly, even if the operating risk may be identical, the risk after factoring in the real estate would be lower for the second group. Obviously, there are other explanations that are also possible (fewer growth opportunities for the first group, etc.).*

4/*Generally, family groups own more real estate. The group is used by the family to diversify its portfolio. Nevertheless, if the group is in a growth phase, this may not be the case as access to equity capital is more limited for a family-owned group, which has to use all of its resources in order to generate alternative financings.*

5/*Because every time a deal involves selling real estate, there will potentially be taxes to be paid (on the capital gains) – stamp duty, land tax – and because there are tax regimes that are specific to real estate (REIT, SIIC, etc.).*

Exercise

A detailed Excel version of the solutions is available at www.vernimmen.com.

1/

See on the vernimmen.com website.

Yes, but the financial situation of the project would be strained. In fact, the cash flows generated by the project are only just sufficient to reimburse the debt when it matures.

On the basis of free cash flows (excluding financing), NPV if real estate owned: €9.2m; NPV if real estate rented: €13.6m. When the financing of the debt is taken into account, the NPV if the real estate is owned would be €17.9m but it would be absurd to keep the same discount rate when the risk has increased as a result of the leverage effect (see Section 28.2, 4/).

No, the risk taken is not the same. Without taking the financing into account, the rental project is substantially riskier than the ownership project. The opposite would probably be true if we took the financing using debt into account. Effectively, if the project is a failure, the debt will still be payable, whereas in the case of a rental, the operator would seek to terminate the lease as soon as possible (all would then depend on the terms for ending the lease). 3.7%.

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NOTES

1 *See Section 7.12.*

2 *See Le Fur and Quiry (2010).*

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Epilogue – Finance and Strategy

It's only au revoir!

We sincerely hope that after reading the 52 chapters of this book, you have not come away with the impression that finance is the most important function of the company!

Experience has shown that groups managed exclusively and excessively on the basis of finance cannot survive. For example, Havas, the leading European media group in the early 1990s (television, radio, advertising hoarding, publishing, professional press, etc.) disappeared in less than eight years, condemned to immobility by the dictatorship of EPS, by regular capital dilutions of subsidiaries aimed at generating exceptional profits that were supposedly recurrent, and by financial shareholders that were too preoccupied with neutralising each other to see that, in a changing world, Havas alone had remained static. Hanson in the UK and ITT in the USA experienced the same fate and for the same reasons.

On the other hand, an industrial strategy without healthy finances is also doomed to failure. This is what happened to RBS after its acquisition of ABN AMRO that was mainly financed by debt. Pooling together two second-tier investment banks with some complementary strengths (LBO financing, emerging markets, etc.) to try to create a top-tier one was not a bad idea in itself – but it was in the autumn of 2007! The financing resulted in too low a solvency position for the combined group, which was only sustainable in a very good economic environment.

This does not mean that a CFO should never become the CEO of a group. Many of the skills that CFOs have to display prepare them well for the position of CEO. However, it is important that former CFOs shed their old skins and adopt a new approach for this new position. The former CFO of Tata Consultancy also became its widely appreciated CEO.

So, we have a healthy situation when the company's financial policy plays second fiddle to its strategy. Strategy is, of course, guided by financial criteria (generate returns on investments higher than the cost of capital), but it remains of pre-eminent importance compared to financial policy.

As corporate strategy is determined by the company's shareholders, and as it depends, even though few will admit it, on the macroeconomic context, financial policy is a function of corporate strategy, of shareholders and also of the macroeconomic environment.

Section 1 CORPORATE STRATEGIES

Corporate strategy can take a number of different forms (diversification, refocusing on a business line, upstream or downstream integration, winning market share, internationalisation, etc.) and leverages internal or external growth. It is one of the visible sides of the invisible hand.

1/ A FINANCIAL READING OF STRATEGY

For a financial manager, these strategies, whatever they are, have a single goal – to enable the company to set itself apart on a competitive market in order to generate income, enabling it to generate higher earnings than its competitors, which in fact are no longer able to compete at the same level. Brands, patents, industrial barriers to entry (minimum size of factories, large advertising budgets, etc.) and legal barriers to entry (concessions, authorisations, etc.) are merely the instruments used to achieve this goal. For a financial investor, the most important role of an entrepreneur or a manager is to analyse the economic, industrial, commercial, technological and competitive environment of the company, in order to develop a policy that will lead to higher earnings.

But, like Penelope, the entrepreneur must continually redo today what was done yesterday. High returns will always attract new players to the sector. These new entrants will seek to get around or demolish the barriers to entry that protect the high earnings. Sooner or later they'll succeed, which will lead to the reduction of margins following the resulting intensification of competition.

When risk is remunerated at too high a rate (for example, certain taxi markets prior to ride-hailing companies), new competitors will enter the sector, which will bring down earnings. When risk is remunerated at too low a rate, companies will abandon the sector, some firms will go bankrupt, the sector will consolidate or integrate (car parts makers, airline companies), which over time will reduce competition and increase earnings. We find here the same line of reasoning we saw for financial securities on which returns are too high or too low, given their risks.

On industrial markets, as on financial markets, a necessary relationship arises between risk and return. On financial markets, which, by definition,

are a lot more liquid than industrial markets, the balance between risk and return is established a lot earlier than on industrial markets. Entering an industrial market involves a lot more than merely buying a share, as on financial markets, and exiting is a lot more complicated than selling a share.

Accordingly, there are some sectors where earnings generated may, over the long term, be higher than normal earnings, given the risk. However, let's not delude ourselves – even if adjustments often take a long time, sooner or later they take place, and abnormally high returns will disappear, regardless of the strategy pursued by the company (see, for example, Siemens).

2/ STRATEGIES BASED ON INTERNAL GROWTH

The aim of an internal growth policy is to develop the activity and the profits of a company by leveraging its resources and capacities, without carrying out acquisitions of third-party companies. The company either plays the innovation card, in order to set itself apart from its competitors, or the cost-cutting card. These two strategies can be combined. Initially, a new market is created thanks to new products or new functionalities (for example, Apple with the iPod, iPad, iPhone and iWatch), then the cost price is reduced (electric cars, laptops).

Achieving the lowest possible cost prices enables the company to fight against the competition, even to eliminate it or to prevent it from entering its sector. Accordingly, the main aim of the industrial policy must be to minimise the cost price of stock keeping units of manufactured products.

In this context, corporate strategy consulting firms in the 1960s, and in particular BCG, demonstrated on the basis of sector studies that a statistical relationship exists between the accumulated volume of production and the unit cost. The greater the accumulated volume of production, the lower the unit cost will be.

The rather simplistic nature of the relationship has elicited some criticism. Nevertheless, in the majority of cases, all sectors can be characterised at a given time by an experience curve on which companies are found at a more or less low level. This type of relationship highlights the importance of the company's growth rate, compared to that of its competitors, and, more generally, compared to its sector. The more a company grows compared to its sector (i.e. the more it increases its market share), the lower its industrial

costs will be, and the better it will be able to withstand competition, and thus to survive. What it does is set up a barrier to entry to new competitors in the form of low earnings prospects. New competitors are obliged to align their retail prices more or less with those of the company already on the market, while their cost prices will obviously be much higher. This results in low, or even negative, margins! Thanks to the size of its market share, the company succeeds in dissuading new competitors from entering the market (e.g. general e-commerce companies up against Amazon). This model holds especially true for sectors that are undergoing rapid development.

Over and above the experience curve, researchers have also observed that an innovation or a new strategic activity field will result in phased growth. The growth rate is initially low, then becomes very sharp before falling to a lower level again in the maturity phase, and becomes negative in the phase of decline. There are specific financial strategies that correspond to each phase of this lifecycle. For example, during the launch phase, the company will require a lot of financing and will have to make use of equity capital. On the other hand, during the maturity phase, the aim is to milk the rent, and debt is very useful at this stage.

The role of the financial manager here is to provide the company with the financial resources it needs for this internal growth policy. In order to implement this strategy, the company sets a target growth rate for the activity, which, to be achieved, requires spending on R&D (innovation), marketing (aggressive sales policy) and on tangible and operating elements (cost price), which is why financing is needed. These financing requirements can be partially, fully or excessively covered by resources that the company generates (its earnings). From a financial point of view, an internal growth strategy will necessarily involve an analysis of the relationship between the growth rate of the operations (measured by the change in sales) and the company's profitability, as we saw in Chapter 36.

We showed that the internal growth rate that the company can bear, without calling on its shareholders or modifying its financial structure, is equal to the return on equity (ROE) multiplied by (1 – payout ratio).

Accordingly, the role of financial policy is to:

better manage the company's need for funds, by ensuring that their growth rate does not exceed that of the activity, through very tight inventory control, customer monitoring, best practice in the use of supplier credit and avoiding investments that are not directly productive;

ensure that ROE is high, notwithstanding a possibly low ROCE (due to heavy investments), by using the leverage effect;

reduce the cost of credit through rigorous debt management;

possibly open up the capital (entry of new shareholders) on the basis of a high valuation.

Although, for the purposes of internal growth, industrial policy involves upstream spending in order to reduce production unit costs or bring out innovation after innovation; financial policy, however, requires rigour and continuity.

3/ STRATEGIES BASED ON EXTERNAL GROWTH

On the other hand, an external growth industrial policy is based mainly on opportunities that arise – the opportunity that a given company is for sale and can be bought, which will require the mobilisation of substantial financial resources within a short timeframe. In these cases, the aim of a financial policy behind an industrial strategy of external growth is to provide the company with access to large reserves of cash, either existing (share issues, bank loans, bonds, etc.) or potential (confirmed but undrawn credit lines, high share prices that will facilitate possible share issues or share exchanges if a merger takes place, etc.). There is the example of LVMH, which built its strategy around regular external growth acquisitions, and had around €6bn in cash at the end of 2019, and had been authorised by its shareholders to carry out capital increases up to a maximum amount of €60bn, without counting its undrawn credit lines (€5.9bn).

4/ THE IMPACT OF STRATEGY ON BREAKEVEN POINT

As we saw in Chapter 10, the notion of a breakeven point is very important because it links profit sensitivity to a variation in activity. The closer a company gets to its breakeven point, the more sensitive it is to a drop in sales. On the other hand, the further off the company is from breakeven, the

less sensitive it is to a change in its activity. It is thus more financially stable.

Accordingly, any strategy, whatever it may be, should be appreciated on the basis of its implications for the company's breakeven point.

If the strategy results in raising it faster than the level of activity increases, the company runs a heightened industrial risk. If, on the other hand, the strategy lowers the breakeven point, the company's industrial risk decreases, unless there is a more rapid fall off in activity.

This strategy cannot be considered independently from the sector in which the company operates. If the sector is cyclical, the company must minimise its fixed costs in order to remain as far from its breakeven point as possible, and to be able to withstand the unavoidable downturns in the cycle. In some sectors, upstream integration (control over suppliers) is a mistake, as it considerably raises the level of the company's breakeven point and, accordingly, of its industrial risk. On the other hand, in a growing sector, industrialisation is not a bad idea, as generally the activity will grow faster than the increase in the level of breakeven. But care should be taken not to make mistakes when assessing the duration of the period of growth. Hence, in 2018 Burberry bought its main leather supplier.

Section 2 SHAREHOLDERS

Legally, the shareholders are the owners of the company and take the decisions relating to strategy and financial policy. Accordingly, shareholders are another pillar of financial policy.

Theory has shown us (see Chapter 19) that, for a given level of risk, the maximum return is achieved when the investor is fully diversified and owns a fraction of each existing financial asset. In such circumstances, the shareholder will be indifferent to the company's strategy and financial policy.

> Practice differs somewhat from theory, as investors are rarely fully diversified. In fact, diverse situations may arise.

there is a majority shareholder who is frequently the manager;

there is a minority shareholder who is the manager;

none of the minority shareholders can, or wish to, become the manager, so shareholders are forced to hand over the management of the company to an external manager.

1/ THE FAMILY-RUN COMPANY

Along with the confusion between the status of the manager and that of the main shareholder, there is also the overlap between the personal assets of the manager and the assets of the company, even though these are legally separated through a limited liability company. In these circumstances, the company's financial policy is merely a tool for achieving the aims of the shareholder whose undiversified portfolio does nothing to put into practice the teachings of theory! Convinced that their activity is the best area for investment, such shareholders also do very little to diversify their family businesses (Gerdau, AB InBev, Lactalis etc.).

On the other hand, why have groups such as Bouygues or Reliance diversified? They were unable to diversify their wealth (which was mainly concentrated in the family business), as this would have meant selling the

business; so the family shareholders diversified their businesses and thereby retained control over them.

For the family-run business, the dilemma is often between growth, control and financial risk. A company that wishes to grow – but whose shareholders wish to avoid being diluted by capital increases to which they are unable to subscribe – is condemned to borrowing and will be fragile in times of crisis (HeidelbergCement, Porsche, Bourbon etc.). Alternatively, it will not grow or may be marginalised on its market and go bankrupt or be bought out.

Audacious but wise entrepreneurs will convince their families of the necessity of diluting control in order to give the company the equity capital it needs to enable it to implement its strategy. And if the strategy is well managed, they will be able to retain control which no one will dispute, notwithstanding their small (10–20%), but well-valued, stake. This is the wager won by the Pernod and Ricard families, who, in the space of 46 years, turned the French pastis leader (with a stock market value of €280m and controlled by the Pernod and Ricard families) into the second-largest spirits group in the world, with a stock market value of €46bn, and in which they now hold only 15.6% of the shares.

There are, of course, companies with margins so high that they are able to finance their own growth without taking out too much debt or without issuing shares that will dilute the founding shareholders too much (Google, Heineken, Richemont, etc.), but these are the exception rather than the rule.

The fifth section of this book may have convinced readers that the resources of financial engineering can always be used to put off the fatal moment by disconnecting the share capital from voting rights, or by bringing minority shareholders into the subsidiaries or the controlling holding company. But let's not fool ourselves. Although these financial arrangements help to save time and to relaunch the development of a group, they always come at a cost, which takes the form of a discount on the share or, amounting to the same thing, a higher cost of capital. They lead away from the basic principle of one share, one voting right. In the long run, they could end up blocking the way forward. Our experience has shown that in such cases they should be scrapped. Pernod Ricard no longer has treasury shares held by one of its controlled subsidiaries, L'Oréal no longer has shares without

voting rights or with double-voting rights, and AXA no longer has a controlling holding company that owns its brand.

2/ THE COMPANY WITH A MINORITY MANAGING SHAREHOLDER

Financial theory is no more applicable when the manager is a minority shareholder. The situation can be relatively complex. The aim of minority managers is to retain control over their companies and also to retain control over their status as managers. They often use financial policy in order to secure the loyalty of their shareholders, by paying out generous dividends, preferring debt to capital increases which would reduce their control over the company, as they generally do not have the financial resources to subscribe to them, etc.

3/ THE COMPANY WITHOUT A LARGE SHAREHOLDER

The problem is quite different when the manager is not a shareholder or only holds a tiny stake in the capital. The risk is that they could pursue goals that are different from those of the shareholders who have given them a mandate to manage the company, involving power, material advantages, popularity in the media (Carlos Ghosn at Renault, Wang Jianlin at Wanda, etc.). In some extreme cases, the goals of the manager could run contrary to those of the shareholders. In terms of financial policy, such managers could:

be tempted to pay out high dividends in order to hypnotise shareholders and get them to forget the value of their shares (which will have little chance of increasing);

be reticent to take out debt, knowing that debt will increase the risk of the company going bankrupt which will result in the loss of their jobs;

be reluctant to carry out share issues that would bring in new shareholders who may challenge their mandates.

The Board of Directors, if it is doing its job properly, should prevent such practices, even if this means getting rid of the manager (Bank of America, SAP).

Section 3 THE MACROECONOMIC ENVIRONMENT

There are three parameters that have a fundamental influence on the company's strategy and on its financial policy:

the growth rate in volume of the economy which serves as a backdrop against which the company performs its activity;

the risk-free interest rate which is used as a basis for determining the cost of equity and the cost of debt;

the rate of inflation which reduces the growth and interest rate for the firm, the real required rate for firms, which can pass inflation on to their customers.

The interaction of these three parameters is more important than their individual impact.

This means that we could have a context of high growth in volumes, rising inflation and negative interest rates, like in Europe during the 1960s or China in the middle of the 2000s. Companies would then be pushed towards borrowing, overproduction and overinvestment which results in inflation profits.[1]

Groups could be set up such that on the basis of their size and their profits they appear to be powerful, but which in reality are fragile due to their financial structure, especially if they have become accustomed to the drug of inflation, which doesn't last. It disappeared suddenly in the late 1970s in Europe and the USA, when governments raised real interest rates to levels above 5%, at the cost of a severe economic crisis.

NOTE

1 See Section 35.1.

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Top 20 Largest Listed Companies

Benelux (in €bn)									
	Group	**Industry**	**Market cap**	**Beta**	**Price to book 2020**	**P/E 2021**	**Sales or net banking income 2020**	**Net income 2020**	**Employees 2020**
1	ASML	Electronics	227	1.27	7.1	44.0	14.0	3.6	28,073
2	Prosus	Internet	146	0.90	4.6	38.1	3.0	3.4	20,524
3	Shell	Oil & gas	120	1.57	1.2	9.7	149.1	(19.0)	87,000
4	AB InBev	Beverage	99	1.31	2.5	23.7	41.1	(0.6)	163,695
5	Airbus	Aviation	78	1.67	12.9	42.6	49.9	(1.1)	131,349
6	Adyen	Fintech	62	0.70	37.3	144.9	3.6	0.3	1,747
7	Heineken	Beverage	56	0.72	3.5	30.5	19.7	(0.2)	84,394
8	NXP Semiconductors	Electronics	44	1.42	3.1	20.0	7.6	0.0	29,000
9	Stellantis	Automotive	43	1.18	1.1	6.3	86.7	0.0	189,512
10	Philips	Consumer goods	43	0.87	2.8	25.0	19.5	1.2	81,592
11	ING	Bank	42	1.55	0.9	10.8	28.2	2.5	91,411
12	Spotify	Media	40	0.75	33.3	EPS < 0	7.9	(0.6)	5,584
13	ArcelorMittal	Steel	27	1.87	0.6	5.3	46.7	(0.6)	167,743
14	KBC	Bank	27	1.44	1.5	13.9	12.0	1.4	37,137
15	DSM	Retail	26	0.71	2.3	30.5	8.1	0.5	23,127
16	Heineken Holding	Beverage	24	0.76	3.3	24.5	19.7	(0.1)	84,394
17	Ahold Delhaize	Consumer goods	23	0.40	1.7	11.9	74.7	1.4	414,000
18	Wolters Kluwer	Publishing	20	0.59	6.4	24.1	4.6	0.7	19,169
19	Akzo Nobel	Chemicals	19	0.79	2.7	21.1	8.5	0.6	32,200
20	Yandex	Retail	17	1.00	5.5	69.9	2.6	0.3	11,864

Source: FactSet, may 2021

Brazil (in €bn)

Brazil (in €bn)									
	Group	Industry	Market cap	Beta	Price to book 2020	P/E 2021	Sales or net banking income 2020	Net income 2020	Employees 2020
	Group	**Industry**	**Market cap**	**Beta**	**Price to book 2020**	**P/E 2021**	**Sales or net banking income 2020**	**Net income 2020**	**Employees 2020**
1	Vale	Metal & mining	88	0.97	1.6	4.5	35.5	4.5	74,316
2	Petrobras	Oil & gas	47	1.37	1.1	4.9	46.3	1.2	49,050
3	Itau Unibanco	Bank	39	0.93	2.3	10.8	32.7	3.2	96,500
4	Ambev	Beverage	36	0.72	4.8	23.0	9.9	1.9	50,000
5	Banco Bradesco	Bank	33	1.12	2.0	9.2	35.1	2.8	89,575
6	WEG	Capital goods	23	0.81	7.8	48.0	3.0	0.4	33,342
7	Santander	Bank	22	1.06	3.1	9.6	12.2	2.3	44,599
8	Rede D'Or	Hospital	22	0.64	23.7	60.9	2.4	0.1	56,356
9	Magazine Luiza	Media	20	1.17	16.0	182.6	5.0	0.1	40,000
10	B3	Financial services	16	1.08	3.1	19.5	1.4	0.7	2,200
11	Banco BTG Pactual	Financial services	15	1.44	2.0	20.3	2.8	0.9	2,500
12	Suzano	Paper	14	0.42	7.5	7.9	5.2	(1.8)	35,000
13	Itausa	Holding	13	0.88	1.8	9.4	1.0	1.2	126,000
14	Banco do Brasil	Bank	13	1.25	1.2	4.9	21.0	2.0	91,673
15	XP	Financial services	12	1.76	17.5	42.6	1.5	0.4	3,651
16	JBS	Food	12	0.83	1.7	8.0	46.0	0.8	250,000
17	Telefonica Brasil	Telecom	11	0.49	1.1	13.4	7.3	0.8	32,759
18	CSN	Steel	10	1.27	2.6	5.0	5.1	0.6	35,053
19	Natura	Consumer goods	10	1.14	7.6	70.9	6.3	(0.1)	1,064
20	PagSeguro	Financial services	8	1.61	10.8	45.1	0.8	0.2	5,836

Source: FactSet, May 2021

China (in €bn)									
	Group	**Industry**	**Market cap**	**Beta**	**Price to book 2020**	**P/E 2021**	**Sales or net banking income 2020**	**Net income 2020**	**Employees 2020**
1	Tencent	Electrical equipment	641	1.17	9.3	33.9	61.3	20.3	51,350
2	Alibaba	Retail	519	1.07	6.1	22.6	65.9	19.3	117,600
3	Kweichow Moutai	Beverage	324	1.06	11.0	46.7	10.7	5.9	29,031
4	ICBC	Electrical equipment	224	0.77	0.8	4.5	165.8	40.1	439,787
5	China Merchants Bank	Bank	170	1.16	1.5	EPS < 0	53.2	12.4	90,867
6	Meituan-Dianping	Retail	167	1.41	7.0	n.s.	14.6	0.6	69,205
7	Ping An	Insurance	167	0.76	2.3	8.1	152.9	18.2	362,035
8	China Construction Bank	Bank	165	0.75	0.8	4.4	150.7	34.4	349,671
9	Wuliangye Yibin	Beverage	142	1.43	6.8	45.6	6.3	2.5	25,882
10	Agricultural Bank of China	Bank	141	0.69	0.6	4.0	134.7	27.4	459,000
11	Contemporary Amperex	Software	116	1.39	7.0	101.1	6.4	0.7	33,078
12	Bank of China	Bank	115	0.72	0.5	3.9	116.7	24.5	309,084
13	Kuaishou	Electrical equipment	94	2.32	Eq < 0	EPS < 0	7.5	(14.8)	21,499
14	JD.com	Retail	86	1.31	7.1	41.1	94.8	6.3	314,906
15	China Tourism Group	Tourism	78	1.34	10.7	53.6	6.1	0.6	10,780
16	Hikvision	Healthcare equipment	75	1.31	8.7	35.0	8.0	1.7	42,685
17	Shenzhen Mindray	Healthcare	73	0.84	15.7	71.3	2.6	0.8	11,833

China (in €bn)									
	Group	**Industry**	**Market cap**	**Beta**	**Price to book 2020**	**P/E 2021**	**Sales or net banking income 2020**	**Net income 2020**	**Employees 2020**
18	Midea	Consumer goods	72	1.03	4.1	18.9	35.9	3.1	134,897
19	Foshan Haitian	Food	71	0.79	19.3	71.3	2.9	0.8	6,058
20	Evergrande New Energy Vehicle	Automotive	61	1.17	67.3	EPS < 0	2.0	(0.9)	8,796

Source: FactSet, May 2021

France (in €bn)									
	Group	**Industry**	**Market cap**	**Beta**	**Price to book 2020**	**P/E 2021**	**Sales or net banking income 2020**	**Net income 2020**	**Employees 2020**
1	LVMH	Luxury goods	319	1.04	5.3	37.4	44.7	4.7	150,479
2	L'Oréal	Consumer goods	194	0.70	4.9	41.9	28.0	3.6	85,392
3	Christian Dior	Luxury goods	113	1.19	5.4	32.8	44.7	1.9	150,479
4	Hermès International	Luxury goods	112	0.73	11.5	58.6	6.4	1.4	16,600
5	Sanofi	Electrical equipment	109	0.52	1.7	13.9	36.0	12.3	99,412
6	Total	Oil & gas	98	1.28	1.2	10.7	105.0	(6.4)	105,476
7	Kering	Luxury goods	84	1.09	6.0	28.8	13.1	2.2	38,553
8	Schneider Electric	Electrical equipment	76	1.04	2.2	24.7	25.2	2.1	126,328
9	BNP Paribas	Bank	68	1.44	0.6	9.9	44.3	6.6	194,976
10	Air Liquide	Industrial gas	67	0.75	3.0	25.5	20.5	2.4	64,445
11	EssilorLuxottica	Consumer goods	61	0.85	2.4	32.3	14.4	0.1	151,017
12	AXA	Insurance	58	1.19	0.8	8.7	101.7	3.0	96,595

France (in €bn)									
	Group	**Industry**	**Market cap**	**Beta**	**Price to book 2020**	**P/E 2021**	**Sales or net banking income 2020**	**Net income 2020**	**Employees 2020**
13	Vinci	Infrastructure	54	1.42	2.5	20.7	43.9	1.2	217,731
14	Safran	Defence	53	1.68	4.2	41.8	16.6	0.4	78,892
15	Dassault Systèmes	Software	51	0.65	7.2	44.7	4.5	0.5	19,789
16	Pernod Ricard	Consumer goods	45	0.63	2.6	30.5	8.4	0.3	18,776
17	Danone	Food	41	0.55	2.7	18.1	23.6	1.9	101,911
18	Crédit Agricole	Bank	38	1.39	0.5	10.7	42.6	2.5	72,520
19	EDF	Power	38	1.01	0.8	15.4	69.0	0.8	165,200
20	Sartorius	Healthcare equipment	35	0.44	12.7	63.0	1.9	0.4	7,566

Source: FactSet, May 2021

Germany (in €bn)									
	Group	**Industry**	**Market cap**	**Beta**	**Price to book 2020**	**P/E 2021**	**Sales or net banking income 2020**	**Net income 2020**	**Employees 2020**
1	SAP	IT services	143	0.95	4.5	22.2	27.3	5.1	102,430
2	Volkswagen	Automotive	123	1.37	0.7	8.1	222.9	8.3	662,575
3	Siemens	Industry	119	1.13	1.9	21.5	57.1	4.1	293,000
4	Allianz	Insurance	90	1.14	1.2	10.9	118.9	6.8	148,737
5	Daimler	Automotive	79	1.56	0.9	7.3	154.3	3.6	288,481
6	Deutsche Telekom	Telecom	76	0.70	2.2	14.5	101.0	4.2	226,291
7	Deutsche Post	Services	61	0.96	3.0	15.2	66.8	3.0	571,974
8	BASF	Chemicals	61	1.15	1.7	14.3	59.1	(1.5)	110,302
9	BMW	Automotive	54	1.17	0.8	7.9	99.0	3.8	120,726
10	Siemens Healthineers	Healthcare equipment	54	0.51	4.6	26.0	14.5	1.4	54,300
11	Bayer	Chemicals	52	1.02	1.5	9.2	41.4	(15.6)	99,538

Germany (in €bn)									
	Group	**Industry**	**Market cap**	**Beta**	**Price to book 2020**	**P/E 2021**	**Sales or net banking income 2020**	**Net income 2020**	**Employees 2020**
12	Adidas	Consumer goods	52	0.99	7.1	34.5	19.8	0.4	62,285
13	Infineon Technologys	Technology	44	1.34	3.4	31.1	8.6	0.4	46,665
14	Henkel	Consumer goods	38	0.65	2.4	19.6	19.3	1.4	52,950
15	Munich Reinsurance	Insurance	34	1.13	1.1	11.9	66.4	1.2	39,642
16	Delivery Hero	Retail	33	0.55	5.5	EPS < 0	2.5	(1.4)	35,528
17	Sartorius	Healthcare equipment	33	0.47	17.5	73.3	2.3	0.2	10,637
18	Vonovia	Real Estate	31	0.50	1.4	22.3	4.1	3.2	10,622
19	Deutsche Boerse	Financial services	27	0.77	4.5	21.9	4.0	1.1	7,238
20	Hapag-Llyod	Transport	27	0.51	1.3	10.9	12.8	0.9	13,117

Source: FactSet, May 2021

India (in €bn)									
	Group	**Industry**	**Market cap**	**Beta**	**Price to book 2020**	**P/E 2021**	**Sales or net banking income 2020**	**Net income 2020**	**Employees 2020**
1	Reliance Industrys	Oil & gas	139	1.05	2.3	21.6	75.6	5.0	195,618
2	Tata Consultancy	Services	126	0.65	9.0	28.1	19.0	3.7	448,464
3	HDFC Bank	Bank	87	1.10	4.2	20.9	18.0	3.7	116,971
4	Infosys	IT services	65	0.76	5.1	25.7	11.6	2.2	189,640
5	Hindustan Unilever	Consumer goods	63	0.59	51.0	58.1	5.4	0.9	21,000
6	Housing Development Finance	Financial services	49	1.24	3.4	37.3	12.9	2.7	5,289

India (in €bn)									
	Group	**Industry**	**Market cap**	**Beta**	**Price to book 2020**	**P/E 2021**	**Sales or net banking income 2020**	**Net income 2020**	**Employees 2020**
7	ICICI Bank	Bank	46	1.43	2.1	19.5	18.7	2.1	97,354
8	Kotak Mahindra Bank	Bank	38	1.07	4.5	48.9	6.7	1.1	71,000
9	Bajaj Finance	Bank	38	1.48	8.9	41.0	3.1	0.5	26,969
10	State Bank of India	Bank	35	1.26	1.0	15.5	46.0	2.5	249,448
11	Bharti Airtel	Telecom	34	0.79	2.7	EPS < 0	11.1	(4.1)	75,485
12	Wipro	Technology	30	0.61	2.8	23.7	7.2	1.2	188,270
13	Asian Paints	Chemicals	28	0.71	16.1	79.7	2.6	0.3	22,974
14	ITC	Bank	28	0.66	5.5	18.6	6.3	1.9	28,115
15	HCL Technologys	IT services	28	0.69	3.6	17.7	8.7	1.3	149,173
16	Axis Bank	Bank	24	1.50	2.2	15.5	9.3	0.8	74,000
17	Maruti Suzuki India	Automotive	22	1.10	5.0	30.6	8.1	0.5	15,945
18	Larsen & Toubro	Industry	21	1.02	3.0	25.5	18.4	1.1	45,268
19	Avenue Supermarts	Retail	21	0.67	18.6	166.8	3.2	0.2	48,408
20	UltraTech Cement	Material	21	0.97	3.8	35.0	5.3	0.7	58,313

Source: FactSet, May 2021

Italy (in €bn)									
	Group	**Industry**	**Market cap**	**Beta**	**Price to book 2020**	**P/E 2021**	**Sales or net banking income 2020**	**Net income 2020**	**Employees 2020**
1	Enel	Energy	85	0.90	2.0	15.6	62.6	2.6	66,717
2	Intesa Sanpaolo	Bank	45	1.14	0.7	12.1	39.0	2.1	105,615
3	Eni	Oil & gas	36	1.20	0.9	14.2	44.0	(8.6)	31,495

Italy (in €bn)									
	Group	**Industry**	**Market cap**	**Beta**	**Price to book 2020**	**P/E 2021**	**Sales or net banking income 2020**	**Net income 2020**	**Employees 2020**
4	Ferrari	Automotive	35	0.72	20.6	43.0	3.5	0.6	4,556
5	Generali	Insurance	27	0.85	0.9	9.8	78.9	1.9	72,644
6	UniCredit	Bank	20	1.35	0.4	9.8	23.4	(3.0)	90,836
7	Snam	Oil & gas	16	0.84	2.3	13.4	2.7	1.1	3,249
8	Poste Italiane	Services	14	1.08	1.3	10.5	30.0	1.2	109,658
9	Moncler	Luxury goods	14	0.92	8.6	36.9	1.4	0.3	4,569
10	Atlantia	Infrastructure	14	1.12	2.1	36.6	7.9	(1.2)	30,659
11	Prada	Luxury goods	13	0.70	3.0	66.8	2.4	(0.1)	12,858
12	Terna	Power	12	0.70	2.8	15.8	2.5	0.8	4,735
13	Davide Campari	Consumer goods	12	0.67	4.2	43.4	1.8	0.2	4,000
14	Nexi	Bank	10	0.94	7.7	35.6	1.7	0.1	1,996
15	Telecom Italia	Telecom	10	1.02	0.5	11.5	15.8	7.2	52,347
16	Recordati	Pharmacy	10	0.64	6.9	24.0	1.4	0.4	4,362
17	Infrastrutture Wireless	Infrastructure	9	0.47	2.8	45.5	0.7	0.2	206
18	FinecoBank	Financial services	9	0.94	6.6	27.9	1.1	0.3	1,262
19	Mediobanca	Bank	8	1.17	0.8	11.6	3.0	0.6	4,920
20	Amplifon	Healthcare equipment	8	0.77	7.5	45.0	1.6	0.1	11,265

Source: FactSet, May 2021

Japan (in €bn)									
	Group	**Industry**	**Market cap**	**Beta**	**Price to book 2020**	**P/E 2021**	**Sales or net banking income 2020**	**Net income 2020**	**Employees 2020**
1	Toyota	Automotive	201	1.08	1.0	11.7	247.8	17.2	359,542

Japan (in €bn)									
	Group	**Industry**	**Market cap**	**Beta**	**Price to book 2020**	**P/E 2021**	**Sales or net banking income 2020**	**Net income 2020**	**Employees 2020**
2	SoftBank Group	Holding	157	1.31	1.8	4.4	51.2	(8.0)	80,909
3	Sony	Consumer goods	104	0.98	2.2	17.9	72.8	9.5	110,000
4	Keyence	Electrical equipment	97	0.95	5.6	52.0	4.4	1.6	8,419
5	NTT	Telecom	81	0.60	1.0	10.8	98.5	7.1	319,039
6	Fast Retailing	Retail	72	0.97	6.5	52.1	16.7	0.8	57,727
7	Recruit Holdings	Electrical equipment	63	1.49	6.0	62.8	19.9	1.5	49,370
8	Nintendo	Consumer goods	63	0.49	3.6	17.5	10.8	2.1	6,200
9	Mitsubishi UFJ	Bank	59	1.10	0.5	10.3	55.6	4.4	138,570
10	Shin-Etsu Chemical	Chemicals	58	1.30	1.9	21.5	12.1	2.4	22,783
11	KDDI	Telecom	58	0.63	1.7	11.7	43.4	5.3	44,952
12	Tokyo Electron	Electronics	58	1.10	4.2	24.5	11.3	2.0	13,837
13	Nidec	Industry	57	1.17	4.8	48.2	13.1	1.0	117,206
14	Chugai Pharmaceutical	Software	52	0.57	6.3	27.5	6.5	1.8	7,555
15	SoftBank	Telecom	51	0.32	6.2	13.4	40.2	3.9	37,821
16	Daikin	Electrical equipment	49	1.03	3.1	39.2	21.1	1.4	80,369
17	Murata Manufacturing	Electronics	45	1.04	2.4	21.4	13.2	1.9	75,184
18	Honda Motor	Automotive	44	1.42	0.7	11.1	123.6	3.8	218,674
19	Takeda Pharmaceutical	Healthcare equipment	43	0.94	1.5	21.5	27.2	0.4	47,495
20	Denso	Automotive	42	1.19	1.1	16.3	39.9	1.0	170,932

Source: FactSet, May 2021

Russia (in €bn)

Russia (in €bn)									
	Group	Industry	Market cap	Beta	Price to book 2020	P/E 2021	Sales or net banking income 2020	Net income 2020	Employees 2020
	Group	Industry	Market cap	Beta	Price to book 2020	P/E 2021	Sales or net banking income 2020	Net income 2020	Employees 2020
1	Sberbank Russia	Bank	74	0.74	1.3	6.5	40.7	9.1	285,555
2	Rosneft	Oil & gas	61	0.80	1.0	5.4	62.1	1.8	356,000
3	Gazprom	Oil & gas	60	0.62	0.3	4.3	76.6	1.6	477,600
4	Novatek	Oil & gas	45	0.66	3.0	12.6	8.5	0.8	15,400
5	Mmc Norilsk Nickel	Metal & mining	45	0.61	11.0	7.6	13.7	3.0	72,105
6	Lukoil	Oil & gas	44	0.85	0.9	7.2	63.0	0.2	100,000
7	Polyus	Metal & mining	21	0.08	18.1	10.5	4.4	1.4	20,385
8	Gazprom Neft	Oil & gas	19	0.72	0.9	5.1	21.7	1.4	78,800
9	Novolipetsk Steel	Metal & mining	17	0.44	2.4	6.8	8.1	1.1	51,900
10	Surgutneftegas	Oil & gas	17	0.72	0.3	4.1	21.7	1.5	113,000
11	Severstal	Metal & mining	16	0.37	3.9	6.8	6.0	0.9	50,000
12	Tatneft	Oil & gas	13	0.94	1.9	6.4	9.0	1.3	60,000
13	Alrosa	Metal & mining	9	0.55	2.4	9.9	2.6	0.4	34,500
14	Rusal	Metal & mining	8	1.06	1.1	3.8	7.5	0.7	48,548
15	Magnitogorsk	Metal & mining	8	0.48	1.4	6.2	5.6	0.5	56,609
16	VTB Bank	Bank	7	0.62	0.4	3.8	17.0	0.8	78,600
17	Mobile TeleSystems	Telecom	7	0.38	10.3	9.2	6.0	0.7	58,415
18	PIK	Construction	7	0.25	3.6	8.1	1.0	1.0	6,000
19	PhosAgro	Chemicals	6	0.04	3.0	8.6	3.1	0.2	10,882
20	Magnit	Retail	6	0.46	1.8	13.2	18.8	0.4	316,001

Source: FactSet, May 2021

Spain (in €bn)									
	Group	**Industry**	**Market cap**	**Beta**	**Price to book 2020**	**P/E 2021**	**Sales or net banking income 2020**	**Net income 2020**	**Employees 2020**
1	Inditex	Consumer goods	93	1.00	6.1	29.3	20.4	1.1	144,116
2	Iberdrola	Energy	73	0.69	1.4	19.3	33.1	3.6	37,000
3	Santander	Bank	55	1.51	0.6	9.4	64.6	(8.8)	191,189
4	Cellnex	Telecom	32	0.45	9.4	NM	1.6	(0.1)	2,008
5	BBVA	Electrical equipment	31	1.51	0.7	10.4	32.9	2.6	123,174
6	Amadeus	IT services	27	1.27	8.2	232.6	2.2	(0.6)	16,550
7	Endesa	Energy	23	0.65	2.6	13.6	16.6	1.4	9,591
8	Aena	Electrical equipment	22	1.13	3.9	282.5	2.2	(0.1)	8,771
9	CaixaBank	Bank	22	1.27	0.7	12.5	10.3	1.4	51,000
10	Telefonica	Telecom	21	1.08	2.3	9.0	43.1	1.3	112,797
11	Naturgy	Energy	21	0.81	1.8	17.4	15.3	(0.4)	9,335
12	Siemens Gamesa	Capital goods	20	0.79	1.7	75.4	9.5	(0.9)	26,114
13	EDP Renovaveis	Energy	19	1.18	1.3	38.8	1.7	0.6	1,735
14	Ferrovial	Infrastructure	18	0.97	3.5	NM	6.3	(0.4)	18,515
15	Repsol	Oil & gas	16	1.26	0.7	9.7	33.3	(3.3)	23,739
16	Grifols	Pharmacy	14	0.41	4.1	22.0	5.3	0.6	23,668
17	ACS	Electrical equipment	8	1.28	2.8	12.2	34.9	0.6	179,539
18	Red Electrica	Energy	8	0.44	2.9	12.2	2.0	0.6	2,051
19	Acciona	Energy	8	0.89	1.5	25.9	6.5	0.4	39,699
20	Fluidra	Healthcare equipment	6	0.55	2.5	30.0	1.5	0.1	5,446

Source: FactSet, May 2021

Switzerland (in €bn)

Switzerland (in €bn)									
	Group	Industry	Market cap	Beta	Price to book 2020	P/E 2021	Sales or net banking income 2020	Net income 2020	Employees 2020
1	Nestlé	Food	285	0.74	5.2	24.5	78.8	11.4	273,000
2	Roche	Pharmacy	239	0.91	8.3	15.4	54.5	13.4	101,465
3	Novartis	Pharmacy	176	0.98	3.3	13.6	42.7	7.1	105,794
4	Chubb	Industry	64	0.99	1.2	15.0	31.6	3.1	31,000
5	ABB	Industry	59	1.22	3.5	24.1	22.9	0.3	105,600
6	Zurich Insurance	Insurance	52	1.26	1.6	13.8	51.5	3.4	52,930
7	UBS	Bank	49	1.32	0.9	9.1	28.3	5.8	71,551
8	Glencore	Metals and mining	45	1.59	1.1	9.7	124.9	(1.7)	145,000
9	Richemont	Luxury goods	45	1.14	2.3	60.5	14.2	0.9	35,000
10	Lonza	Pharmacy	40	1.00	4.3	45.0	4.2	0.7	16,540
11	TE Connecticity	Electronics	37	1.14	3.1	21.9	10.9	(0.2)	82,000
12	Sika	Construction material	35	1.11	9.8	40.3	7.4	0.8	24,848
13	Givaudan	Chemicals	32	0.78	7.5	39.1	5.9	0.7	15,852
14	Partners Group	Private Equity	32	1.08	10.8	36.0	1.5	0.8	1,519
15	LafargeHolcim	Construction material	32	1.21	1.0	14.9	21.6	1.6	67,409
16	Alcon	Pharmacy	31	1.12	1.4	38.5	6.0	(0.5)	23,655
17	Kuehne	Transport	30	0.79	8.2	31.5	19.0	0.7	78,249
18	STMicroelectronics	Electronics	28	1.31	3.2	22.0	9.0	1.0	46,016
19	Schindler	Industry	25	0.68	7.1	31.3	9.9	0.7	66,674
20	Swiss Re	Insurance	25	1.30	0.9	13.6	37.5	(0.8)	13,189

Source: FactSet, May 2021

UK (in €bn)

UK (in bn)	Group	Industry	Market cap	Beta	Price to book 2020	P/E 2021	Sales or net banking income 2020	Net income 2020	Employees 2020
	Group	**Industry**	**Market cap**	**Beta**	**Price to book 2020**	**P/E 2021**	**Sales or net banking income 2020**	**Net income 2020**	**Employees 2020**
1	Unilever	Consumer goods	128	0.50	10.2	19.4	50.7	5.6	149,000
2	Linde	Industrial gas	125	0.98	4.3	30.9	23.9	2.2	74,207
3	AstraZeneca	Pharmacy	116	0.52	9.0	20.0	24.2	2.8	76,100
4	HSBC	Bank	106	0.99	0.8	12.4	68.1	3.5	235,000
5	Diageo	Beverage	87	0.92	8.0	29.0	13.4	1.6	27,788
6	Rio Tinto	Metal & mining	87	1.12	2.2	6.9	39.1	8.6	47,474
7	GlaxoSmithKline	Pharmacy	77	0.66	15.8	13.7	38.4	6.5	94,066
8	British American Tobacco	Tobacco	71	0.84	1.7	8.2	29.0	7.2	55,981
9	BP	Oil & gas	71	1.58	1.2	10.2	158.2	(17.8)	63,600
10	Reckitt Benckiser	Consumer goods	53	0.31	3.8	21.0	15.7	1.3	39,553
11	Anglo American	Metal & mining	48	1.65	1.3	6.9	27.1	1.8	64,000
12	Prudential	Insurance	46	1.72	2.4	12.9	49.1	1.9	18,687
13	Vodafone	Telecom	44	0.97	0.7	20.9	45.0	(0.9)	93,000
14	London Stock Exchange	Financial services	43	0.79	6.2	27.4	2.7	0.5	5,554
15	RELX	Commercial services	42	0.90	15.5	21.9	8.0	1.4	33,200
16	National Grid	Utilities	37	0.64	1.6	17.2	16.6	1.5	23,069
17	Lloyds Banking Group	Bank	37	1.39	0.9	8.3	38.4	1.0	61,576
18	IHS Markit	Services	36	1.00	3.1	34.2	3.8	0.8	16,000
19	Barclays	Bank	34	1.69	0.5	9.2	31.1	1.7	83,000
20	Compass	Catering	32	1.27	9.3	58.0	22.7	0.2	548,143

Source: FactSet, May 2021

United States (in €bn)									
	Group	**Industry**	**Market cap**	**Beta**	**Price to book 2020**	**P/E 2021**	**Sales or net banking income 2020**	**Net income 2020**	**Employees 2020**
1	Apple	Consumer goods	1,833	1.16	12.7	26.2	244.9	51.3	147,000
2	Microsoft	IT services	1,578	1.13	10.9	32.6	129.4	40.1	163,000
3	Amazon	Retail	1,452	0.75	21.5	64.9	338.7	18.7	1,298,000
4	Alphabet (Google)	Internet	1,238	1.00	4.8	27.7	160.0	35.3	135,301
5	Facebook	Internet	647	1.03	6.3	25.2	75.4	25.6	58,604
6	Tesla	Automotive	568	1.32	16.8	165.8	27.7	0.6	70,757
7	Berkshire Hathaway	Holding	524	0.89	1.4	24.9	215.4	37.3	360,000
8	JPMorgan Chase	Bank	387	1.24	1.5	11.9	111.6	25.4	255,351
9	Johnson & Johnson	Pharmacy	356	0.65	5.9	16.9	72.4	12.9	134,500
10	Visa	Financial services	328	1.11	12.4	41.6	19.5	9.4	20,500
11	Walmart	Retail	327	0.52	4.4	25.8	486.9	11.8	2,300,000
12	UnitedHealth	Insurance	313	1.06	4.8	21.5	225.6	13.5	330,000
13	Mastercard	Financial services	312	1.24	46.8	48.5	13.4	5.6	21,000
14	NVIDIA	Technology	310	1.43	16.2	44.4	14.5	3.8	18,975
15	Bank of America	Bank	289	1.36	1.1	13.5	83.3	15.7	213,000
16	Home Depot	Retail	289	1.05	126.3	25.3	115.0	11.2	504,800
17	Walt Disney	Leisure	281	1.02	3.1	92.2	58.2	(2.5)	203,000
18	Procter & Gamble	Consumer goods	271	0.68	5.5	23.7	64.2	11.8	99,000
19	Paypal	Technology	256	1.21	8.5	57.5	18.8	3.7	26,500
20	Comcast	Media	214	0.91	2.5	19.2	90.8	9.2	168,000

Source: FactSet, May 2021

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